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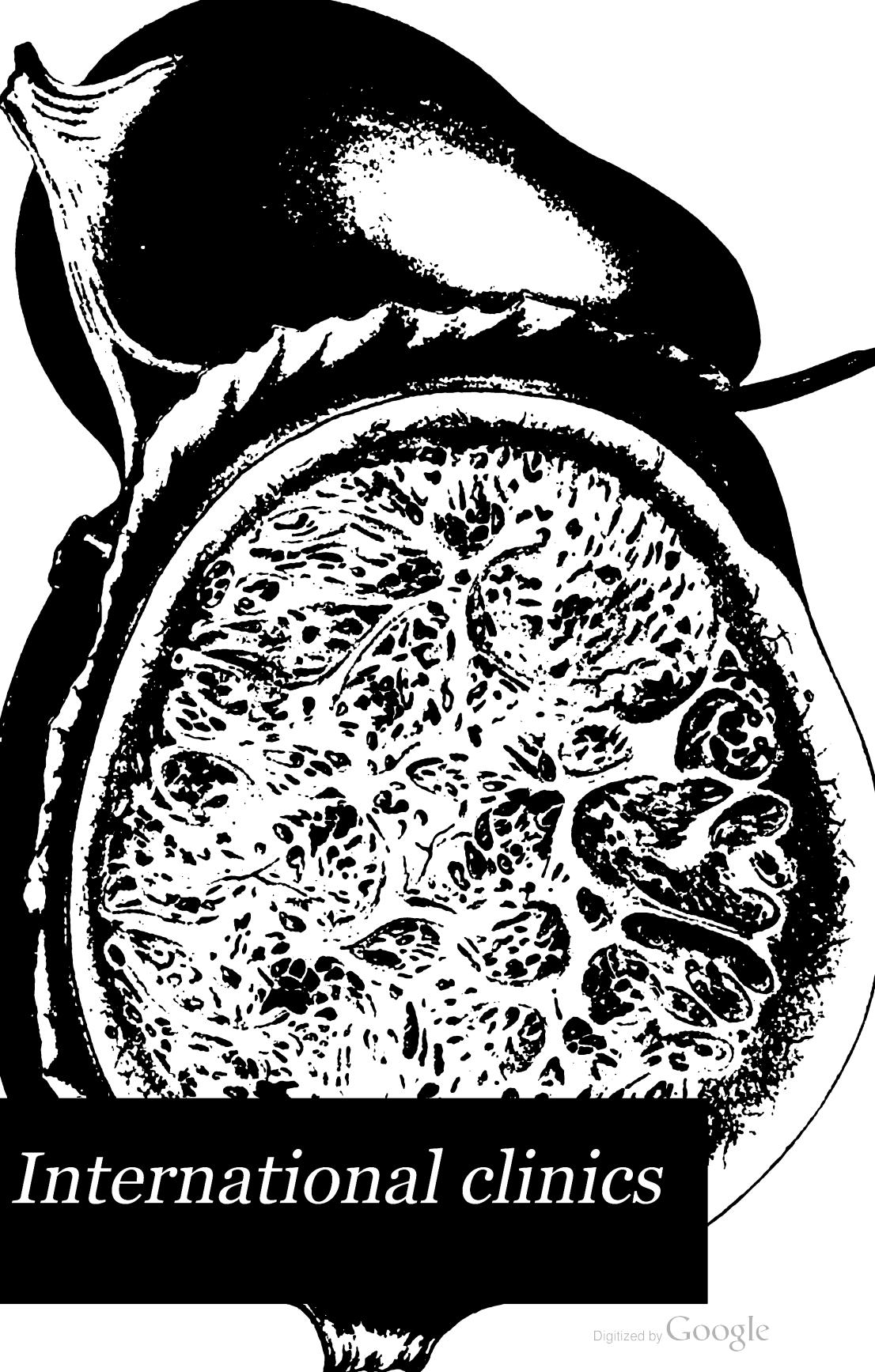
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ON

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LARYNGOLOGY, PHARYNGOLOGY, RHINOLOGY,
OTOLOGY, AND DERMATOLOGY,

AND SPECIALLY PREPARED ARTICLES ON TREATMENT.

BY PROFESSORS AND LECTURERS IN THE LEADING
MEDICAL COLLEGES OF THE UNITED STATES,
GERMANY, AUSTRIA, FRANCE, GREAT
BRITAIN, AND CANADA.

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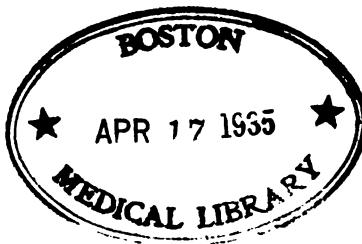
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VOLUME III. SIXTH SERIES. 1896.

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Treatment.

REMARKS UPON THE TREATMENT OF CARDIAC DISEASE.

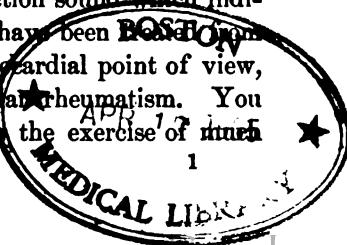
CLINICAL LECTURE DELIVERED AT THE BELLEVUE HOSPITAL MEDICAL COLLEGE.

BY BEVERLY ROBINSON, M.D.,

Professor of Clinical Medicine in the Bellevue Hospital Medical College, New York.

GENTLEMEN,—I think that, as a rule, medical lectures are more interesting when they are upon the subject which is most upon the mind of the lecturer. For this reason I propose to depart from the usual rule, and instead of beginning my lecture by remarks upon this patient before us, I shall narrate the history of an interesting case which recently came under my observation.

A boy, Alexander C., eighteen years of age, came into my service at St. Luke's Hospital in the latter part of 1892. He had had two well-defined attacks of acute articular rheumatism, and it was probable that with one of these attacks there had been some involvement of the heart. When admitted to the hospital he was complaining of difficulty in breathing, pain around the praecordium, and he had some fever and a slight cough. On auscultation, we found the evidence of endocarditis, and, in view of the other symptoms mentioned, we thought it probable that there was an acute endocarditis engrafted on his former trouble. There was also evidence in the left lung of either pneumonic infiltration, accompanying or following an endocarditis, or of a pure hyperæmia of the lung. We were in doubt for several days as to which of these two conditions was present, but after careful observation we determined that there was a lobar pneumonia on the left side associated with evidence of subacute articular rheumatism. After a few days he also developed a friction sound which indicated acute pericarditis. Now, this boy might have been ~~POSED~~ ^{APP'D} from the pericardial point of view, or from the endocardial point of view, or for the lobar pneumonia, or for the articular rheumatism. You see that the treatment of such a patient required the exercise of much



good judgment and common sense, and a nice weighing of all the points involved. It has seemed to me that a careful study of this case might prove interesting and profitable to us.

My first thought is in regard to the prophylaxis of cardiac disease,—not in hospitals but in private practice. It is not in the hospitals that you are bothered with these questions, for here the attending physician is an autocrat. In a case of moderate endocarditis we give sodium salicylate, and keep the patient quiet, and feel that in due time he will recover; but we must look ahead and think of the dangers of chronic endocarditis, and the attendant valvular lesions of the heart. When once such a lesion is established a cure is beyond medical skill. In the treatment of acute endocarditis in connection with rheumatism, I think there is no reason for believing that the administration of salicylic acid or the salicylates will prevent the occurrence of valvular disease, although by such medication we shall undoubtedly mitigate the pain. The great point in the treatment is to keep the patient perfectly quiet for a long time. This is far more important than simple medication, for this, experience has taught us, is a true prophylactic measure. Now, in the case I have alluded to, it is evident that absolute rest must be an important factor in our treatment, for if it be neglected all our medication will count for but little. In addition to this, the age, sex, temperament, and occupation of the individual must be considered. Admitting that the acute trouble has been cured and there is still a chronic condition present which cannot be cured, what is the treatment to be? In some cases it may be perfectly proper and right that you should tell the patient the nature of his trouble, while in others you would make a sad mistake by acquainting the patient with the fact that there is heart-disease. I have known very courageous and strong-minded men to be thrown into a pitiable condition of terror or hopelessness by a physician telling them that they had heart-disease. In such cases the whole trouble might be obviated by a proper explanation to an intelligent patient of the significance of whatever lesion had been found. In this connection I wish to impress upon your mind, as forcibly as possible, and without fear of being contradicted by any physician of much experience, that the mere existence of a cardiac murmur is a very small matter. For example, I call to mind at this moment a patient whom I have had under observation for fifteen years or more, and who has a very marked degree of mitral stenosis, and yet his general health continues to be exceedingly good. Would it be right, therefore, for you on discovering such a lesion to immediately read this patient his death warrant? By no means; you

must take into consideration certain other factors and modifying circumstances. Now, all these thoughts have been suggested to me by this patient whose history I have read to you. He came to my office the other day looking extremely well and happy. Did I make such a prognosis at the time I saw him at the hospital? No, and it is for this reason that I dwell upon the importance of weighing well the factors which enter into the prognosis.

A few months ago I saw a man sixty-five years of age, who had œdema of the feet, anæmia, aortic regurgitation, poor digestion, and palpitation of the heart on slight exertion,—in other words, his condition was extremely bad, and I thought he was going to die. He has not died, however, but is now in much better health. Before I saw him, his heart had been examined by another physician who stated that he had no organic heart-disease. This seems to be remarkable, yet it is literally true. It is of course, exceptional to find cardiac disorder develop so suddenly. You will find in the second volume of the new American Text-Book of Medicine, edited by Dr. William Pepper, of Philadelphia, an article by himself on the treatment of chronic valvular lesions. In this article he reports a case which is almost an exact counterpart of this one I have just related. This proves to you that for long periods of time patients with chronic cardiac disease may have no serious symptoms, and yet such symptoms may develop quite suddenly and with much severity. When the cardiac disorder is thoroughly developed there is a plan of treatment often adopted known as Professor Oertel's treatment. It consists in the systematic use of graduated exercises of a certain kind, such as mountain climbing. This treatment is very valuable in certain cases, but in others it is exceedingly pernicious; hence, such a method of treatment should not be resorted to without carefully pondering upon the individual case. There are many patients with cardiac disease who cannot take even very slight exercise without exhibiting every evidence of cardiac insufficiency; to these the treatment is evidently not adapted. Patients having bad habits and a bad hereditary history often enter our hospitals with hypertrophy and dilatation of the heart, yet they will often say that they have noticed no symptoms of their trouble until within a few days or weeks of their admission to the hospital.

I have touched upon the importance of rest in acute disease of the heart. What do we see in a condition of compensation in heart-disease? Such a patient will often not be in bed more than twenty-four or forty-eight hours before he will tell you he is better. It is not necessary to

pour into them digitalis and caffeine or strophanthus ; far better is it to administer some simple remedy which will improve the condition of the gastro-intestinal tract, for such simple medication along with rest will accomplish wonders. It is very common for these patients to be injured by over-zealous medical practitioners who insist upon administering large doses of cardiac stimulants, thus unnecessarily over-straining the heart. Remember, then, that when the heart is doing its duty well, there is no indication for the administration of cardiac drugs ; to do more than to secure rest and proper digestion is to do harm.

This leads me to make some remarks on the treatment of those cases of cardiac disease where the heart is incompetent. You can relieve the obstructed circulation through bloodletting, purgatives, or cardiac stimulants. This having been done, the other symptoms which arise must be treated individually. There is no question that wherever there is a distinct cyanotic condition and the venous circulation is engorged, moderate bloodletting will relieve the heart when no other known method will do so. Unfortunately, in times past this practice was carried to great extremes, and hence it has become with us a "lost art." There are many times when a patient will seem practically pulseless, and where the lower extremities will be oedematous, and there will be an effusion into most of the large serous cavities ; where it seems dangerous to employ free purgation on account of its weakening effect, and yet I have time and again seen such patients relieved almost magically by repeated doses of almost drastic purgatives. Do not therefore ignore this important fact, nor be afraid to try such remedies in appropriate cases.

The best clinicians are far from agreeing as to the effects of cardiac stimulants. Professor Osler, one of our very best authorities on such matters, says that there is no better drug than digitalis, yet this is not in accord with my experience, for I believe that caffeine is much more valuable. I am not alone in this opinion, for eminent clinicians abroad hold caffeine in equally high esteem. It is very difficult to lay down hard and fast rules as to the use of these remedies. Digitalis is certainly indicated whenever you have before you the evidence of a failing heart ; when there is no longer compensation, when there is infiltration of the lower limbs, and dyspnoea on exertion. I believe you should begin with small doses and watch its effect carefully. Where its administration is followed by an increased quantity of urine and increased force to the pulse, it is plain that you have done good ; but in other cases you will find that it causes nausea and vomiting, and in-

creases the irregularity of the pulse without in any way lessening the dyspnoea. In this latter class of cases my disposition is to give caffeine in repeated doses, and I base this preference on clinical experience, and on a proper interpretation of the researches made on animals. These investigations have shown that digitalis, at the same time that it increases the force of the heart, also contracts the blood-vessels, and hence, according to my way of thinking, increases the peripheral resistance, and with this the work the heart has to do. The present fashion is to administer strophanthus in cases where digitalis fails, and yet some highly honored men in our profession have expressed very serious doubts recently as to the utility of this much-used drug. Not many years ago belladonna was the great heart stimulant, especially in cases of collapse from sudden shock or great loss of blood, but fashions change and it is now but little used. Do not be in a hurry to cast aside the older and well-tried remedies simply because they are old.

In this lecture I have endeavored to give you some few thoughts deduced from this one case, and I hope you have found it as profitable as if I had shown you a great variety of cases.

SOME CAUSES OF UTERINE HEMORRHAGE, AND THEIR TREATMENT.

BY THOMAS OLIVER, M.A., M.D., F.R.C.P., F.R.S.E.,

Physician to the Royal Infirmary, Newcastle-upon-Tyne.

COMMENCING when girls reach the age of fourteen or fifteen years, the menstrual life of women terminates when they attain the age of forty-five or forty-six. These are the average periods, although in many instances absolute cessation of the menses does not occur until wellnigh the fiftieth year of age. During these limits nothing, as a rule, occurs in healthy females to check the regularity of the monthly flow but pregnancy. It makes all the difference to the subsequent health and comfort of a girl as to how she enters upon her menstrual career. Pain, scanty flow, and tardiness in the appearance of the sanguineous discharge generally mean future trouble for the individual, whereas, not only for the girl in health, but for her sister who retains the remnant of previous illness,—such as, for example, a cardiac lesion, consequent upon rheumatic fever,—the painless appearance of the first menses and a normal and subsequent regularity of the flow are clear indications of proper nutrition, subsequent growth, and future health. To the monthly flow in women, when it is excessive, we apply the term menorrhagia, and to uterine hemorrhage occurring in the intermenstrual period, metrorrhagia is applied.

The causes of menorrhagia and metrorrhagia are constitutional and local. Of the constitutional causes we have debility, such as that observed in women of the poorer classes, following upon over-lactation, who, in spite of the reappearance of the menses, continue to suckle the baby into the eighteenth or twentieth month, thus experiencing the bad effects of a double drain upon the system. By stopping the nursing and administering iron and strychnine, we soon place such patients in the way of losing their uterine hemorrhage. Very frequently as women approach the climacteric they become the subjects of an obstinate form of metrorrhagia, one that is sometimes troublesome to treat, but saline aperients, with ergot, or ergot and potassium bromide, are well worthy

of a trial in these cases. Of the hemorrhages associated with mitral heart-lesion, Bright's disease, etc., we need say nothing at present other than this, that it is necessary to treat the condition upon which the bleeding depends, taking full cognizance of the state of the general health.

To-day we shall deal more with the local than the constitutional causes, and of these the first that calls for consideration is *subinvolution of the uterus*. After parturition, the process by which the uterus regains its normal size is called involution, and if after either a confinement or a miscarriage this process is retarded or arrested the uterus is said to be subinvolved. The organ remains large and soft and is inclined to bleed readily. Involution of the uterus should be complete a few weeks after labor. Immediately before the expulsion of the foetus, the uterus measures fourteen inches in length and weighs about twenty-five ounces ; shortly after birth it is seven inches in length, and if the process of involution goes on naturally the organ, in five or six weeks afterwards, will measure three inches, and weigh only two ounces. The first step in the process of involution consists in the supply of blood being cut off by the post-partum uterine contractions. These continue while fatty degeneration of the muscle-fibre and absorption complete the process. Many circumstances may interfere and prevent this slow return of the womb to its normal size,—e.g., the uterine contractions may be imperfect ; there may be great post-partum debility ; the woman may have got up too soon after her confinement, or there may have been some previous pelvic inflammation which delays the uterine contraction. Subinvolution is more prone to follow abortion than labor at full term, and for this reason : after the termination of a natural pregnancy the uterus has ceased to enlarge. Its normal tendency is to contract, but in abortion, although the ovum has ceased to grow, the uterus is not prepared for the expulsive event ; it remains therefore enlarged, whilst the patient herself is not disposed to take the same care of herself as she would do after a normal utero-gestation. The result is repeated uterine hemorrhage. In some women the womb remains soft and flabby, the “os” is gaping, and there is a tendency for the organ to be, in addition, retroflexed. For such cases the local abstraction of blood by scarring the enlarged cervix, the intra-uterine application of a liniment of iodine, the insertion of glycerin pads into the vagina, and the use of douches, along with the internal administration of salines and ergot, or small doses of oil of turpentine, accompanied by rest in bed, will do much to check the hemorrhage and rid the patient of her troublesome symptoms. Should the uterus be retroflexed, reposition of the organ

and the introduction of a pessary may be necessary. In other cases the womb feels enlarged and is hard ; the organ is bent backward, and pressure upon it is painful. Walking and sitting are both irksome to the patient, the "os" is abraded, and there is uterine catarrh. The wearing of a pessary may be necessary for such, or the interior of the uterus may require to be touched with carbolic acid. In a few patients the uterus is bent, and fixed low down in the pelvis ; the symptoms continue for years, and are difficult to cure.

It is a good rule to allow no case of uterine hemorrhage to continue without making a vaginal examination, and where there is neither a polypus nor cancer, to dilate the cervix and explore the interior of the womb. Dilatation may be effected by means of tents made of sponge, laminaria, or of tupelo wood, placed in the cervix over night and removed next morning. Although easy of insertion there are numerous objections to the use of the sponge tents : they have an extremely foul odor on their removal, and in their expansion the processes of sponge find their way into the crypts of the cervical mucous membrane, creating therefore a very raw and unhealthy surface. Laminaria tents are better. They are not quite such septic instruments, but as I have also seen very troublesome consequences follow their insertion, I have practically discarded this slow method of dilating the cervix for the rapid one, which I find is easily and promptly accomplished by means of Duke's, Marion Sims's, or Hegar's metallic dilators. An increasing experience only confirms me as to their utility and the superiority of rapid over slow dilatation of the womb. Under any circumstances dilatation of the cervix uteri should not be undertaken if there is extensive or recent pelvic peritonitis.

The most common cause of uterine hemorrhage, in my opinion, is *fungating endometritis*. The uterine mucous membrane becomes swollen and studded with minute vegetations, or it may be that the placental villosities left after a confinement have not disappeared. Repeated abortions by keeping up recurrent congestions cause it. Fortunately most cases of fungous endometritis yield to treatment. There is no line of treatment more successful than that which consists in rapidly dilating the "os," curetting the interior of the uterus, and swabbing it with strong iodine liniment. As a rule, there is not much bleeding while a patient is being curetted, but there is a form of diseased endometrium in which the woman at the time of the operation loses an enormous quantity of blood, and so uncontrollable is the hemorrhage that it looks as if she would bleed to death. I have seen a few such cases in which neither the application of perchloride of iron nor iodine had any im-

mediate effect, and where the only serviceable remedy was the intra-uterine douche of extremely hot water, firm compression of the uterus, and plugging of its interior with strips of iodoform gauze.

A *papillomatous* or *sarcomatous* degeneration of the endometrium is equally troublesome. When in such a case the finger is *in utero* the internal lining is found to be rough and brittle: the mucous membrane breaks down under the finger. In these patients there is a history of very severe bleedings, of foul discharges, and of fragments being expelled, not unlike portions of a polypus. Patients who are thus afflicted become cachectic, and although the uterus is curetted the symptoms are only subdued for a short period: they return with unabated vigor. These are the cases that bleed freely at the time of scraping the endometrium.

It is not often we meet with cases of *malignant adenoma* of the uterus. As a patient with this disease recently consulted me, I give you a few details of her illness. Mrs. A., aged fifty-six years, a healthy woman and the mother of a grown-up family, consulted me in the fall of 1894 on account of daily uterine hemorrhage; her menses had ceased eight years previously, and there had been no vaginal discharge of any kind until three or four months prior to my seeing her. On examination, I found the cervix uteri healthy, and the uterus movable and not to any extent enlarged. As there was no evidence of malignant disease in the cervix, I tried her with a mixture of bromide of potassium and ergot, and gave her a saline aperient, but, as the bleeding continued, I subsequently dilated the cervix and curetted the uterus, at the same time taking care to swab out the interior with iodine liniment. For two or three months she was much better, but by degrees the sanguineous discharge returned, and as it was apparent that there must be, from her age and the daily bleeding, even although the discharge was never offensive, something more serious than fungating endometritis, I suggested the removal of the uterus *per vaginam*. At my request Mr. W. G. Black, one of the assistant surgeons to the Royal Infirmary of this city, extirpated the uterus *per vaginam*. Beyond a troublesome cystitis, which lasted a few days, the patient made a good recovery. It is now ten months since the operation and nothing has arisen to mar the progress of the case. The uterus was only slightly enlarged. On slitting it open, the endometrium was seen to be rough and studded with large granular masses varying in size from a split pea to a small bean. Under the microscope the tubular gland structure of the uterine mucous membrane was observed to be highly developed, and was resting upon ground tissue highly cellular and extremely vascular. The

growth was an adenoma, apparently malignant, rather a rare affection and interesting on account of it being present in the uterus of a woman fifty-six years of age, the lining membrane of whose womb ought to have been atrophying. The microscopical examination of the specimen showed how very proper was the line of treatment adopted,—viz., total extirpation.

A *retained ovum* may be the cause of very severe and continuous hemorrhage. A woman who is two or three months pregnant has symptoms of abortion, but after a time, and while the pain has subsided, the bleeding still continues. The “os uteri” remains open, and by degrees not only does the vaginal discharge become offensive, but the patient becomes feverish and restless, and complains of headache. As the signs indicate that decomposition of the ovum has taken place, and that absorption of the decaying products is causing septicæmia, the only satisfactory treatment is to dilate the cervix, remove the degenerating ovum, curette the uterus, and douche with some antiseptic solution. These cases generally do well if thus treated early.

The diagnosis of *placenta prævia* comes rather within the scope of the obstetrician than the gynæcologist, but it is sufficient for me to state here that, after having made your diagnosis, if the bleeding is not severe and time is therefore given you to arrange your plans, it is frequently the best treatment, under these and more urgent circumstances, also, to terminate the pregnancy by inducing premature labor.

Into the pathology and treatment of *fibrous tumors of the uterus* we cannot enter to-day, but of the soft *mucous polypi* that spring from the lining membrane of the cervix, and which may be seen protruding through the “os,” I will simply say this. They may cause troublesome bleeding, bleeding far in excess of what the size of the polypi suggests. In snipping them off with scissors the hemorrhage, if the polypi be large and their attachment broad, may be profuse. It is better, therefore, to twist them off, or adopt a line of treatment which Dr. Marion Sims suggested,—viz., the insertion of a sponge tent into the cervical canal. As the sponge becomes swollen it completely destroys the polypus, particularly if it is small, by pressure.

Carcinoma of the cervix or of the body of the uterus is a common cause of hemorrhage, and it would be well when uterine bleeding in a woman is recurrent, and particularly if the patient is past the climacteric, that she should consult early in her illness a doctor, and that the medical man should make a vaginal examination at no distant date after her first consultation. I know of no cases which, if the disease is treated early, is limited to a small part of the cervix, and the uterus

is freely movable, can be so hopefully dealt with, either by amputation of the *cervix uteri* or by total extirpation of the organ *per vaginam*, as those of cancer of the womb. Left too long, however, so that the disease has extended into the uterus, or has invaded the peri-uterine tissues, and I know of no illness more painful or depressing to the patient, and none more trying to the friends. I do not say that every total extirpation, even if the case is seen early, will be successful, but I can point to patients at the present time who, though it is seven or eight years since their *cervix uteri* was amputated or their uterus removed bodily for cancer, are still in the enjoyment of perfect health.

THE TREATMENT OF TIC DOULOUREUX.

BY GILLES DE LA TOURETTE, M.D.,

Visiting Physician to the Hospital Cochin, Paris, France.

IN the treatment of this most painful of nervous diseases it is well to be armed with every possible method of procedure, and I hope to be able to demonstrate that the treatment which we have adopted will always be found eminently successful.

In establishing the diagnosis a number of questions are necessary. It will be found, as a rule, that those afflicted with this disease have suffered terribly, so much so that they can neither eat nor sleep, and that they frequently fall off in weight as much as twenty pounds. The patient whose history I am about to relate is a typical example of facial neuralgia, and life had become to her unsupportable. At present she expresses herself as perfectly delighted with the treatment, and feels as though she were almost completely cured. According to her own expression, by contrast she feels as if she were in Paradise.

Briefly expressed, her history is as follows: She is thirty-five years old and there is nothing of interest in the family history. She had always been well up to the age of twelve years, when she first began to menstruate. That very same day she suffered from a headache which lasted for two days. It first appeared on the right side and on the following day on the left. Subsequently she had several attacks, and now, at the age of twenty-seven, she has had in addition several attacks of hysteria. Hysteria is frequently associated with facial neuralgia, and it is sometimes difficult to distinguish between the two conditions, but more of this later. She was married at the age of twenty, and has two sons, one of whom enjoys excellent health and is now twelve years of age. The other at the age of seven suffered from facial neuralgia. In 1892 she suffered from her usual headache, which began at her menstrual period, and was associated with a new and much more severe pain in the right side of the face. When this facial pain first appeared she had five teeth removed, without the slightest amelioration of the trouble. In this respect her experience has not been an unusual

one, and you should never advise patients to have their teeth removed for facial neuralgia, as it will never do any good. In my own experience I have never seen the slightest relief follow the extraction of teeth even when the pain was shown to radiate from the dental branches of the inferior or superior maxillary nerve. I have even seen an entire set of teeth removed by the dentist in the case of facial neuralgia without the slightest benefit to the patient. After her teeth were removed our patient remained in about the same condition for some time, when suddenly the pain left her, returning again in December, 1893, for the second time. This attack lasted five weeks. In 1894 she had a similar attack, and in 1895 one that lasted for five months. It was during this last attack that she consulted Dr. Quénau, my surgical colleague, but before performing a neurotomy of the facial nerve, the doctor referred the case to me for medical treatment.

Volumes have been written on facial neuralgia, and while great men like Charcot, Troussseau, and many others have added considerably to our knowledge of the subject, there still remains a great deal that is obscure about this condition. Let me begin by giving the origin and distribution of the nerve in question. Deeply seated in the brain, it has two roots, one a distinct motor root, with which we have nothing to do in such a case as this, and the other root, a sensory one. These two roots are united in the ganglion of Gasser, which occupies a groove on the superior surface of the petrous portion of the temporal bone. At its ganglionic enlargement the nerve divides into three branches: the ophthalmic, the superior maxillary, and the inferior maxillary or mandibular branch. The painful points which are observed in the course of a neuralgia of this nerve are usually located around those foramina at which the nerve emerges from the skull to be distributed upon the face. For the ophthalmic branch we have the supraorbital point; then the palpebral point, at the external portion of the eyebrow, and the nasal and ocular points. On the superior maxillary branch we have the dental or alveolar point immediately below the orbit, the palatine immediately behind the incisor teeth, and the malar point just behind the last molars. For the inferior maxillary branch the painful spot is usually the mental foramen, or one side or the other of the tongue itself. While this last condition is not a common one it is an extremely painful affection, as the slightest movement of the tongue excites a paroxysm.

But little is known of the etiology of this affection beyond those rare cases in which tumors have pressed upon some portion of the fifth nerve, either in its entirety, as in the ganglion of Gasser, or somewhere

throughout one of its branches. Another cause of tic douloureux may be a fracture of one of the bones in the neighborhood of the nerve. Similarly, but little is known as to the true etiology of sciatica.

Tic douloureux, or facial neuralgia, occurs in one of two principal forms. In the first variety it is usually due to cold, la grippe, or the like. The pain is continuous and never very severe as a rule. The pain continues for several days and then disappears. It is increased by fits at coughing, during mastication, and even by the act of speaking. In the second form the attacks occur paroxysmally, and are very sudden in their onset. Each attack lasts but a few seconds, but is extremely severe during that time. Sometimes the pain is so intense in its character that it may be compared to the lightning pains of locomotor ataxia. Often it seems to originate from the brain itself, and finally appears on the face. The attacks may be provoked by such acts as mastication, speaking, coughing, walking, sneezing, swallowing, etc. At such times the patients suffer so intensely that they are unwilling to make the slightest effort of any kind. Some patients become so apprehensive of the pain, even while they are temporarily free from it, that they have committed suicide in consequence. Pressure at times where the facial nerve makes its exit from the skull seems to suppress and help to relieve the pain. You have no doubt observed such patients with a handkerchief constantly in their hands ready for instant use, and you can sometimes diagnose or at least suspect some such trouble from this fact.

The difference in these two forms consists principally in the symptoms. In the first variety the pain is a continuous one and is equal during the time it lasts, being generally stronger at the beginning of the attack, and becoming gradually less as the attack wears off. In the other form the pain is sudden, paroxysmal in character, and passes away like a stroke of lightning. Associated with this painful condition there are usually other signs, such as redness of the skin on the affected side of the face, which is often warm and shiny. The eye on that side is congested with swollen conjunctiva, and eyelids red and angry-looking. The lobe of the ear appears swollen and protrudes from the face, and the tears which are often acid in reaction cause a perceptible track upon the face. The flow of saliva is increased and headache may or may not be associated with it.

As to the diagnosis, tic douloureux may be confounded with migraine and with hysteria. In the former condition, however, the pain is confined to the head, where it begins and ends. The pain, moreover, is a continuous one and has no crisis. Patients with migraine

seek eagerly for quiet and endeavor to hide somewhere in the dark, as the pain is much increased by light and by any noise. They usually vomit, and such patients will be found with their eyes half closed as if in sleep. The condition is very different in facial neuralgia, and the differential diagnosis should not be difficult.

When, however, we come to distinguish this condition from hysteria, the task is not such an easy one, as neuralgic pains may be present in this condition, and it is sometimes difficult to distinguish them from attacks of true facial neuralgia. During the time I was acting as Professor Charcot's chief of clinic, we published together five cases of this kind which were treated by us during our hospital service. The closest observation is sometimes necessary to establish the correct diagnosis. In hysterical cases the symptoms of this neurosis, while they vary considerably, will frequently be characteristic, such as the alternate crying and laughing, which are not present in tic douloureux. These patients, moreover, have hallucinations and clonic contractions and the urine presents characteristic reactions on analysis.

The prognosis in tic douloureux should be a guarded one, because the pains will recur. Professor Troussseau has said that he never saw a case of facial neuralgia which was entirely cured, but in these latter days I have seen more than one case which has seemed to yield to the method of treatment of which I am about to tell you. This refers to the medical treatment, for I have never seen a neurotomy secure a permanent and complete recovery. The treatment which I have adopted is very simple, but it is none the less efficacious. This you can see for yourselves by the number of cases which I bring before you weekly, and of which the present example is a typical one.

My treatment consists simply in giving extract of opium in progressively increasing doses, and then decreasing in the same way. This form of treatment was followed by Troussseau and Charcot in the following way: they gave their patients on the first day two pills, each containing two centigrammes (or $\frac{1}{10}$ of a grain) of the extract of opium. The next day they gave three pills, and progressively raised the dose to 8, 10, 12, 14, 16, 18, 20, 22 centigrammes (about $3\frac{1}{2}$ grains), which was the maximum that the patient took in one day. Little by little the pains grew less and less, and finally ceased altogether.

Now, at what point should the opium be stopped? What may be regarded as the maximum dose? The dose must be regulated according to the severity of the neuralgia, and its increase should cease the day the patient has no pain. The question may well be asked, Is there any danger of poisoning? to which I would reply that there is

a remarkable tolerance for opium on the part of these patients. Trouseau speaks of having given fifteen grammes (231.5 grains) a day of opium, and yet no bad symptoms arose. It is a fact that patients even under this treatment do not sleep as heavily or seem to be affected as profoundly by the drug as other patients who are taking smaller doses of opium. Constipation is apt to be associated with the use of the drug, but this tendency can be overcome by the use of purgatives, and the moment that the pain ceases, then give a smaller and smaller dose, until finally the patient has come down from twenty-two centigrammes in a day to two centigrammes, when the drug can be abandoned altogether.

THE MOUNT-BLEYER PHOTO-FLUOROSCOPE.

ORIGINAL COMMUNICATION TO THE ROYAL ACADEMY OF MEDICINE AND SURGERY, NAPLES, ITALY.

BY J. MOUNT BLEYER, M.D., F.R.A.M.S.,
New York City.

GENTLEMEN,—The idea of seeing by human device through many inches of solid matter is no longer a chimera, although still considered one only a few months ago, to men advanced in cathode-ray analysis and experiments.

What is the advantage discerned by us in this latest discovery of science? To what limit does our expectation of its practical use in our own science run? Our latest experiments with these unknown rays have enabled us to reach and have actually revealed to our eyes the human heart, lungs, skull, bones, larynx, accessory cavities of the face, and, in fact, most of the internal and hidden parts of the body. This is an extraordinary fact. To our ancestors it would have appeared a miracle, ascribable only to some supernatural agency, preferably that of the devil; for, in the gloomy mood which they carefully cultivated, the devil appeared to be a more potent agent in mundane affairs than good itself. Even to us of the present, who have carefully eliminated the supernatural in every form, and who have been made callous to the marvels of the natural world by the thick-coming sensations that day by day and even hour by hour crowd upon our senses, this is an event altogether out of the common. But we are still little more reasonable than our progenitors. After the first stunning effect of an announcement of this sort we rebound into an unreasonable state of expectancy. We are not content with the marvel of the moment. We anticipate the future. We would outstrip nature and plunge into the supernatural. We exaggerate, we augur the utmost. We are disappointed if our fondest anticipations are not immediately realized.

The most appropriate remarks are those uttered by Mr. Denshaw, one of the few remaining followers of Zoroaster, who identifies the

unknown light as one manifestation of what has been known to Eastern scientists as astral light, or the seventh dimension of matter.

"As we touch the borderland between the known and the unknown we just begin to comprehend in the shadows which float around us how matter and spirit flow into each other, and we reach out with still more eager hands to fathom the great mystery of life and evolution."

"The analysis of the akasa or ether by the Vedas thousands of years before Christ, the transmission to the Eastern Hindoo sages, receiving from them clearer illustrations and greater force as they came down through the ages, no longer shut up in the mountain monasteries, are springing into life and strength at the magic touch of science."

"The Röntgen light before which the invisible and the opaque become transparent is the clairvoyance of science, standing, perhaps, in the same rank in some way not now understood, but reaching the same results as the mental or spiritual clairvoyance which has long been a mysterious but demonstrated fact."

Another disciple of this school, Dr. Guernsey, applied such terms as the "cathode rays" of clairvoyance, and "the all-seeing light;" he said it was impossible at this early state of development to form more than the faintest conception of the revelation of hitherto closely guarded secrets of nature to which it opens the door.

"In studying the molecules of matter in the attenuated ether of the high vacuum bulb, which, propelled by the cathode pole, strike out with such fierce energy as to pass through flesh, metals, bone, wood, and, in fact, all opaque objects to the photographic plate beyond, we seem to have within our grasp and subject to our control those physical particles which are supposed to constitute the physical basis of the universe. These little particles of radiant matter, which exist everywhere through the atmosphere,—so minute that a quadrillion of them roam with freedom in a bulb some four inches in diameter,—are in some of their properties as material as the floor upon which we stand, while in other properties they almost assume the character of radiant energy, moving with such rapidity as to permeate all bodies and all space, not simply penetrating the unoccupied space between the atoms and molecules, but filling the entire domain of the physical from atom centre to atom centre, and from space to space as one indissoluble soul."

"Without the omnipresent atmosphere or ether of nature the phenomena would cease. Communication of energy from sun to planet, from constellation to constellation, could not be maintained unless it be

conceded that motion, which is an inseparable factor of all energy, can travel through abysmal voids without any medium of transmission."

"Every step in this discovery along these physical lines approaches nearer and nearer to the spiritual ideal and the demonstration of physical energy which bridges the chasm between mind and matter."

I make these quotations simply to show that this school of philosophy has also taken up the subject of X-rays, from their point of view, which they claim demonstrates many of their beliefs of the unseen. This question is, however, to be disputed on many lines of thought by non-believers. It will be curious, nevertheless, to learn what the great psychologists and other logists will teach us when they finally reach their conclusions.

Sufficient of the practical value of the application of the Röntgen rays to medicine and surgery is already known for us to pronounce them and the wonderful screen that reflects them as among the greatest triumphs won in the modern history of invention.

I am happy to say that after much experimenting in this field I have been enabled to produce the photo-fluoroscope.¹ This invention enables the eye and the photographic sensitive plate to record simultaneously images as we are desirous of putting them on record.

The photography of luminous objects has been for some years an important factor in astronomical studies, as, for example, in the mapping of the stars, in the recording of solar and stellar spectra, and in the phenomena of eclipses, but of late it has been made to embrace a broader range of subjects. Several of the most reputable photographers and scientists have of late given this special branch much thought and study, and among them I cannot pass by without mentioning a most beautiful set of pictures made by Nicola Tesla and Wallace A. Levison, whose illustrations of luminous objects have given me much pleasure and useful suggestions. I owe to the study of them the invention of the instantaneous photo-fluoroscopic photography of luminous objects taken directly from the fluorescent screen.²

The invention bears my name (Bleyer's photo-fluoroscope), and is very simple. It is practically an adaptation of the fluoroscope to the needs of the physician and surgeon, and consists in the combining of direct and instantaneous photography of the shadow thrown on the

¹ I am indebted to Mr. A. A. Hammerschlag and Mr. F. J. Harrison (editor of Anthony's Photographic Bulletin) for most valuable suggestions during the progress of this investigation.

² Some of these luminous pictures can be found in Scribner's Magazine, June, 1891, and in the Century Monthly Magazine, April, 1895.

fluorescent screen. In other words, it is simply a combination of an ordinary copying photographing camera and a fluoroscopic screen of special size carefully fitted into the camera. Several other types of cameras can be adapted also for this purpose. The screen receives the object fully outlined in all its detail, while the camera is so arranged as to take time exposures of the object made visible on the screen. By this means the object can also be seen and studied and the trouble located before the photograph is taken. Then the proper focus is secured by properly adjusting the camera, and a direct photograph obtained. The sensitive plate is then removed to the dark room and is there prepared like any other photograph.

FIG. 1.

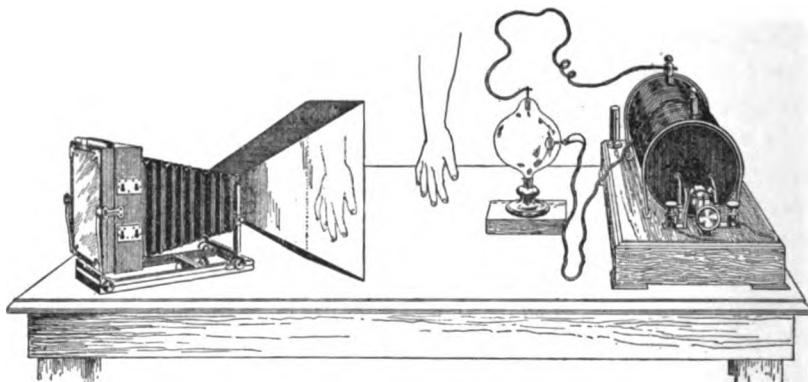


FIG. 1.—To the left of this illustration is seen the camera fully equipped with its accessories, mounted on a table, and its fluoroscope attached, showing on its screen a hand ready to be photographed directly from its luminosity. The screen is arranged so that any sized object can be taken in. The fluoroscopic box is very light and made from cardboard fitted close on to the camera. The lens is encircled by a zinc sheet, thus preventing stray Röntgen X-rays from reaching the sensitive plate through the wooden portion of the camera. On the right side is a Crookes tube attached to a Ruhmkorff coil which can be operated either by a spring vibrator, or, preferably, by a break-wheel. The entire picture shows the full operation of photo-fluorographing. There are other important attachments which need no description here.

The photo-fluoroscope has the advantage over other similar inventions of revealing the object on the screen to the naked eye, and reproducing it at the same time on a sensitive plate. This renders the apparatus of peculiar advantage to physicians and surgeons for positive diagnosis. The photograph is necessary only for recording purposes, as the object can be seen plainly by the naked eye, the phosphorescence making it possible to see the object plainly. Necessarily, this is more advantageous to physicians than the general method of shadowgraphing by the ordinary plate holder, with the object placed thereon without the assistance of the camera.

As far as we know at present in regard to the Röntgen rays the laws as applicable to light are entirely disobeyed, and consequently no lenses or cameras can be taken into consideration. This light does not admit of being, so to say, refracted or reflected in the same manner as ordinary light, so that there is no possibility of the direct use of the camera with the Röntgen rays. But the onward march has added the fluorescent screen, by means of which the eye can follow the rays through hitherto impenetrable substances, and with its assistance I have succeeded in establishing the method illustrated, which, for the uses of physicians and surgeons, is simpler and gives infinitely more satisfying results than any other method of which I know at present. The difficulty in accomplishing this can be appreciated only by those who have followed up the subject and worked in the laboratory side by side with companions in the race for priority, and with full knowledge of the thousands of difficulties that beset the endeavors of the experimenter.

One of the most important advantages that the photo-fluoroscope presents over the Röntgen method of photography is that curves, corners, and angles are no obstacle to it, while an object in the Röntgen shadowgraphy must always be in direct contact with a plate-holder containing the sensitized plate, the reason being that the Röntgen X-rays must be applied directly on the surface of the object, while with the photo-fluoroscope it may be taken at a short distance. This is due to the fact that the laws of light applicable to photography have been overcome by photographing the luminous shadow from the screen and by the use of lenses.

A paper containing an abstract of my lecture, which will be found printed in the New York *Medical Journal*, April 25, 1896, contains an account with much detail on the invisible light of the spectrum, and therein I showed partly its relation to the present status of Röntgen shadowgraphy. Here I take up some of the physical phenomena noted in connection with direct photography by ordinary light rays which obey the laws governing the phenomena as they are known to us. This will make the subject-matter herein spoken of more intelligible to my readers.

It remains a demonstrated fact that a ray of light can be separated into its proximate or ultimate colors. These various portions of colored light have certain distinct properties, which have been most carefully investigated by different physicists. The illuminating power of the spectrum, as might be imagined, exists in the most luminous portions of the band of colors,—viz., in the yellow light,—and experiments

carefully conducted by Herschel and Fraunhofer confirm this fact, and show that the greatest amount of light exists nearer the red than the violet end of the spectrum. The calorific power of the spectrum increases gradually from the blue color; it rises to its maximum intensity in the red, but what is most curious, it reaches its greatest elevation beyond the limit of the visible red ray or red end of the spectrum.

The invisible rays of heat are therefore more powerful than the other heat-giving rays of the spectrum accompanied by light, as the yellow, orange or red colors, the luminous radiations, do not give so much heat as the non-luminous ones, and Tyndall, speaking of this remarkable circumstance, says, "In the region of the dark rays beyond the red the curve shoots up in a steep and massive peak, a kind of Matterhorn of heat which dwarfs by its magnitude the portion of the diagram representing the luminous radiation."

What is of most value now is the consideration of the chemical influence of the spectrum. The chemical influence, unlike the heating and illuminating rays, is at its minimum at the red end and rises gradually in intensity towards the violet. Light, as we know, acts as a chemical agent, not only with certain portions of its luminous rays, but like heat with its non-luminous rays. Ritter, of Jena, discovered that the chloride of silver was acted upon and blackened beyond the violet end of the spectrum.

Dr. Hentschel and Dr. Wallaston confirmed these facts. These chemical or actinic rays have been carefully studied and most industriously employed, so that a new art has been created which is now called photography, and to-day we have made it one of the most subservient of additions to the requirements of industry and science. This late addition of instantaneous photo-fluoroscopic photography is most valuable to the medical and scientific worlds. Moser has solved for science a valuable truth by showing that certain rays have the power to set up chemical change, and this once begun may be continued with other colored rays that could not in themselves produce chemical decomposition. He shows this experiment by taking an iodized plate, with an engraving placed over it, and exposing it to light until the action had commenced. If this plate was then placed under the violet glass a picture was soon obtained, while a very long time elapsed and the result was imperfect when the same plate, after exposure to sunlight, was placed under a red glass. If, however, the prepared plate was first exposed in a camera to a blue light and then placed under the red glass, the picture was speedily obtained. In

my article on "New Rays of Röntgen: The New Photography," etc., in the New York *Medical Journal* April 25, 1896, I gave some detailed accounts, which were found to be most appropriate at this stage of the study on shadowgraphy by means of the fluorescent screen, etc. In these remarks phosphorescence has been considered, and here it may be mentioned that Becquerel calls the rays capable of setting up or commencing chemical action "exciting rays," and others which only possess the power of continuing a chemical change "phosphoregenic," or "continuing rays," and has identified the latter with the power possessed by light of rendering certain bodies luminous. Of these I have also spoken in the same article. It is the phosphoregenic rays extending from the indigo to beyond the violet ray which render certain bodies phosphorescent by insulation. Becquerel has invented a most ingenious instrument, called the phosphoroscope, by which substances, as the tungstate of calcium and all others which have the same property of giving off fluorescence, can thereby be viewed directly after exposure to light, and the duration of the phosphorescent power accurately determined. Thus several bodies which are only phosphorescent for some fraction of a second have thereby been added to the long list of substances affected in a similar but more decided manner.

Professor Stokes has investigated with the greatest care the phenomena which he entitles fluorescence, or internal dispersion. Figures or letters painted with a strong solution of sulphate of quinine in tartaric acid become curiously self-luminous when the rays which have passed through blue or violet glass are allowed to fall upon them.

A tube of uranium glass conveying the coil discharge in vacuo is similarly affected by this peculiar electric light. It was ascertained that prisms made of glass appeared to absorb a larger number of the more refrangible rays, and Professor Stokes found that by using prisms made of quartz he could obtain with the electric light a spectrum six or eight times as long as the ordinary one, and his experiments indicate that the chemical, the luminous, the phosphoregenic rays, as rays of high refrangibility, are intimately connected with each other, and are only so many effects of one and the same cause. These experiments were based on the facts that when bright rays from the electric lamp are passed through blue glass and then permitted to fall upon a plate of glass colored yellow by the oxide of uranium, the latter becomes self-luminous, and emits rays which are altered in their vibratory power, the original rays having undergone a change in their refrangibility.

The Practical Points in Photography by Means of the Photo-Fluoroscope.—Above all things in photo-fluorography a dark room is required. Here the object to be photographed should first be located with the fluoroscope in order to fix its exact position. This done, the screen on the photo-fluoroscope must light up the object until every detail shows clearly. Now shut off the X-rays before introducing the sensitized plate into the camera to avoid any possibility of fogging the plate. After the preliminary steps have been attended to the X-rays are turned on and an exposure varying from one to two minutes is allowed, depending upon the density of the object. Good, strong X-rays are required, and it will be found that a coil giving a spark from six to eight inches will answer all purposes for ordinary work. In fact, all accessories should be in first-class working order. Much experience is also necessary, and is the best teacher for obtaining good results by this method as by the Röntgen. The sensitive plate should not be removed until the X-rays have been shut off. Upon these few and simple injunctions depends the success of the use of the photo-fluoroscope. I succeeded as early as April 7 in locating a tube in the larynx and another that had slipped down into the trachea, and recorded them as shown in the accompanying pictures (Figs. 2 and 3) in the early and undeveloped stages of my photo-fluoroscope, and before the Crookes tubes were brought up to standard make. I nevertheless present them as early experiments herein, knowing that they will create curiosity and induce others to follow my footsteps in the use of the X-rays in laryngology.

In my lecture, April 15, 1896, before the Medico-Legal Society, I referred to this fact, notes of which were also published at the time. I refer to these dates now in confirmation of the priority of the objects located and photographed by me over those recently obtained by Dr. Levy, of Berlin, and others in England, and mistakenly accorded the priority in several of our dailies only.

At present much of my time and work with the photo-fluoroscope is being spent in shadowing out tumors, growths, foreign bodies, and various diseased conditions of the larynx and bones of the face and their accessory cavities, and the lungs with their many complicated ailments. In these experiments I have so far been very successful in obtaining first-class definitions of the varying shadows, illustrating many interesting clinical conditions of these organs.

The results of my further records and experiments will be taken up in a paper following this.

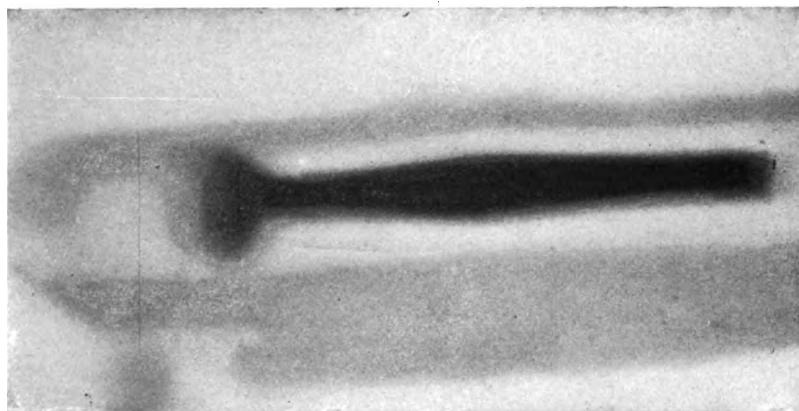


FIG. 2.—Photograph of an intubation-tube found in the trachea, April 2, 1896. Operated upon successfully.

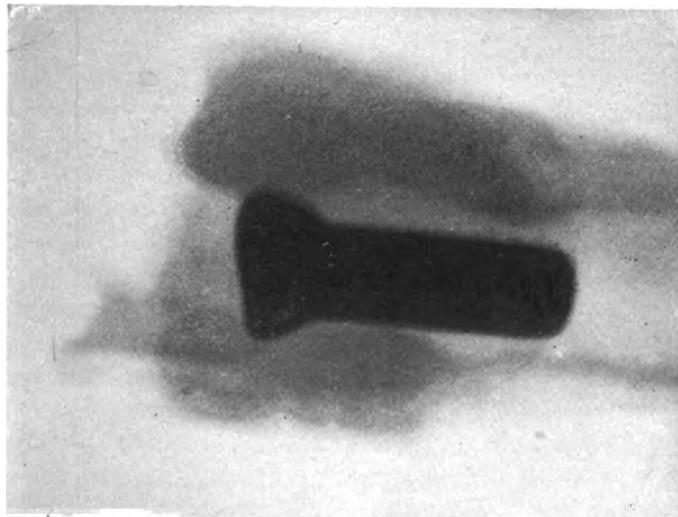


FIG. 3.—C. H., age 17. Diphtheria, laryngeal complications, showing the tube in the subglottic region, which had slipped down, owing to the absorption of the inflammatory exudation. Recovered the tube, April 16, 1896.

THE TREATMENT OF POST-PARTUM HEMORRHAGE.

POST-GRADUATE CLINICAL LECTURE DELIVERED AT ANCOATS HOSPITAL.

BY EDWARD STANMORE BISHOP, F.R.C.S. (Eng.), F.R.C.P.
(Edin.), A.M.,

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GENTLEMEN,—This subject is one which, unfortunately, I cannot demonstrate directly by means of a case. When one occurs it occurs without warning, and must be dealt with immediately. It cannot be saved for a clinical lecture. It is, at the same time, by reason of its sudden urgency, of such great importance, that I shall attempt to describe graphically the usual scene at the bedside, so that you may recognize at once what is happening and act promptly in such an emergency. I am the more anxious to do this, as I differ entirely from the usual line of treatment, as you will find it laid down in books.

Imagine that you are sent for, when you have settled in practice, to attend Mrs. Jones in her confinement. It is her third child, and her two previous labors have been normal, though rather tedious. There has been nothing unusual about the pregnancy. She lives in the next street, and it is nine o'clock in the morning. You find her downstairs, and she explains that, although the pains began about five, she does not feel bad enough for bed, but wishes to insure your attendance. You make an examination, and you find that your patient is at the beginning of the first stage. The os is the size of a shilling and the presentation is normal. Three or four times during the day you see her again, only to find that things are slowly progressing. About mid-day the membranes rupture, but the os is still only the size of a half-crown ; the pains are short, not very frequent, nor very forcible. The last thing at night you see her again. No great change. At two in the morning you are sent for. She is now having strong pains, with intervals of two to three minutes. The child's head is down on the

perineum and advancing with fair rapidity. In another hour the child is born, and the placenta, after a little delay and some compression from without, is expelled. You examine it, and it is complete; nothing has been left behind. You have carefully followed the uterus down with your hand as the placenta came away, and you feel it hard and firm above the pubes. The binder is carefully applied, and you turn away from the bed to wash your hands, feeling quite easy about her. The history of a normal, though slightly prolonged, labor is it not? Nothing whatever to suggest to you that in another couple of hours that woman will be dead, and that during that time you will work as you have not worked for many a month. As you are drying your hands, the patient quietly remarks that something is running from her. When you look at her, you notice that she has suddenly become very pale. You pass your hand under the bedclothes, and find several clots of blood between the thighs, while a warm stream flows over your hand. Down go the bedclothes, and you see blood gushing from the vulva, inundating the bed. Rapidly you unpin the binder and feel for the uterus, which five minutes before you felt easily a hard, firm body. Where is it? The abdomen appears equally soft and flabby all over. Feeling about, you find above the umbilicus something like the edge of a pancake. You press upon this and it becomes firmer. You compress it downward, and try to find its continuing ridge. You use both hands to gather it up and squeeze it together. Part remains firm, but the rest is as flabby as ever, and when you have succeeded in compressing this, the firm part seems imperceptibly to melt away. All this time the maddening stream of blood from the vulva continues. Meanwhile, the patient and her friends have discovered that something is wrong. "What is it, doctor? Is she flooding?" An exasperating question, since every one can see that she is. What is to be done? Ergot, of course; and you give a dose. "Oh, doctor, I do feel so bad; what is it? Am I dying?" "Nonsense; you'll be all right again directly. Here swallow this. Some brandy; make haste." She swallows it obediently, and is sick at her stomach. Still the flow goes on, quickened somewhat by the vomiting. "Inject some ergotine; that ergot has come back. Give a little more brandy. Ah! I must plug the uterus. Give me a couple of handkerchiefs or a big sponge. Draw her to the side of the bed." "Oh, doctor, let me die! let me die! Oh, I do feel so ill!" "Now keep your hand on that belly. Where on earth is that uterus? Relaxed again." You hunt for it with one hand, while with the other you clear out clots from the vagina, blood all the time rushing past

your hand. You get your plug well into the uterus, up as far as you can ; but the fundus seems beyond your reach, and you pack it tight, delighted to find that while you do so the womb seems to contract upon it and becomes more palpable to your external hand. "That's done it, I think ; but we'll give more ergotine, to make sure. Why, the uterus is relaxing again, and blood is still trickling." Feeling desperately anxious, you dispatch a note to your nearest neighbor, asking him to bring ether, perchloride of iron, and a battery. The patient is now gasping for breath, tossing about, while, with running pulse, and still, as though determined to thwart you, an ever-widening trickle of blood escapes from the genitals. "Have you any hot water ? Well, go and put some on at once. Meanwhile, flick the body with a cold towel. Get me a lump of ice." Still pressing on the abdomen where the uterus should be, but apparently is not, you pass your fingers up the vagina, and find the plug, which was so firm, a limp, wet mass, quite loose from any grip. You remove it and insert your hand bodily. It appears to go into space ; but in a second or two you feel a faint grip, and, encouraged, you squeeze the two hands together in an attempt to compress the uterus between them. It responds somewhat, but only partially and slightly. You slip in a lump of ice. "Ah ! thank Heaven, here comes Dr. Brown ! Have you the ether?" "Yes." "Well, give her a syringeful ; she's very bad. Bring the battery here. Now, you press on the belly and help me to get that womb to contract." "Yes ; but where is it?" "There's one edge. Follow it up ; squeeze, man, squeeze it hard. Can't you feel it?" "Yes, I think so. No, it's gone again." "Give her some more brandy. If she can't swallow it, just inject it into the bowel. Is she alive?" "Just, I think ; but she's very bad. How long has this—" "Oh, squeeze, man ; don't bother with questions. There, I've got one rheophore in ; now put the other over the belly just above the pubis." "It's very dark, doctor ; I can't see. Oh, give me some air,—air ! I can't breathe !" "Open the windows. Lift the foot of the bed. Inject some more ergotine. How's the bleeding?" "I think it's a little less." "How's the pulse?" "Running and intermittent ; can hardly feel it. She's very bad." "Well, this is no use. We'll have to inject. Bring the iron solution. That'll be enough, I think. It's certainly checked it. Ah ! but not quite ; there's a thin, red trickle over the blackened surface. She looks very bad, and her pulse is gone. Her heart beats, though. Shall we transfuse ? I'll give you some blood. Now, are you ready ? Stay, though ; I fear she is gone." Two long-drawn gasps at a little interval, and battery, ergot, iron, and all are useless.

The woman who yesterday was well and hearty is dead, with hardly an ounce of blood in her body, while the bed, the carpet, and your own clothes are soaked through with the fluid, whose escape you have been so vainly trying to prevent.

Now, what is the meaning of all this? Why has the woman died? Was it through any fault of yours? You go home and consult your books. You have omitted nothing of all the lists of remedies mentioned in them, and you did not waste time over any one; but as soon as you saw that one did not bring about the desired result, you "tried," as the books say, some other. Stay, though, you omitted using an ether spray to the lower abdomen, turpentine internally, and compression of the aorta. Well, you haven't an ether spray; and as to compression of the aorta, Leishmann says there's just a ray of hope in it *when all else has failed*, and Barnes says it may be of momentary use to gain time for the use of important remedies, all of which you did. Clearly, then, as you *did* find time for them, this cannot have made much difference. But the turpentine, how could you have forgotten that? If you had only given her half an ounce of turpentine, as Leishmann recommends, you might have saved her. Poor soul, she was very sick, though. Would it have stayed on her stomach, I wonder. However, you will try it next time. And that ergotine. What a fraud it was! You will try some other maker. It's abominable the way people's lives are risked by adulteration, etc.

Let us cool down, however, and try and get a clear idea of the case as a whole. Obviously, this woman has bled to death. Why? In what is the essential difference between this case and any other normal labor? for everything *was* normal until the labor was finished. In normal labor the uterus contracts and remains contracted after it is empty. In this the uterus contracted firmly once, then relaxed, and from that time never properly and thoroughly contracted again.

But we get other cases of furious hemorrhage where, by prompt action in the right way, we are easily masters of it. Take this for example. A man's leg is rapidly removed, say by a circular saw. You have there a bleeding surface, blood spouting from vessels over an area about equal in size to that left on the interior of the uterus when the placenta has been detached. The first and obvious duty of the surgeon is to compress the main artery. Once that is done, and *while that is persisted in*, all else is easy. The vessels are tied *seriatim*, and all danger from that kind of death is over. Suppose the surgeon were to begin by tying the vessels, he would lose valuable time and the patient still more valuable blood. Still more, if he applied ice, or boiling hot

water, or poured styptics over the stump, or injected ergotine, you would say, naturally, that that sort of treatment was prearchaic and could only succeed by the merest chance.

Our case is the same, with certain differences. We, too, have a large bleeding surface, supplied by a main artery. The differences are these. In the severed leg the vessels can be seen and tied. In the uterus the vessels are hidden from view. In the leg the vessels *must* be tied by the surgeon. In the uterus the internal muscular fibres, *when they are in a fit state to act*, will tie them for you. In the case of the leg the line of the main vessel is well known, and every surgeon's thumb goes instinctively for it. Is this not also true of the main vessels supplying the uterus? Well, so far as I can see, its existence has been ignored, and great confusion has arisen through the stress laid by some books "on the numerous anastomoses of the pelvic circulation," through which blood will again be carried to the bleeding surface if any attempt is made to interfere with it. What are these anastomoses? The uterus is supplied by two pairs of arteries—the spermatic and the uterine—and by no other. The spermatic anastomose with the uterine and each other, and with no other. The uterine anastomose with each other and with the spermatic, and with no other. The first spring directly from the aorta at a point about three inches above the umbilicus and run down beside and in front of it for some distance. They are the least important. The latter spring from the internal iliacs, branches of the common iliacs, in their turn the direct continuations of the aorta. All these vessels, then, with their anastomoses, spring from the aorta, and pressure upon this at the level mentioned will control them all. Pressure below this, as low as the sacral promontory, will control the two largest vessels. Much has been made of the possible leakage from the veins, but this is utterly unnecessary. There is no driving force behind the venous blood, the walls of the veins tend easily to collapse, and though they might be dangerous in the erect position, in the normal position in bed, there is no action of gravity to favor escape from these vessels.

In drawing your attention to this I do not merely, then, add to your already unwieldy list of remedies to be "tried." In ordinary surgical cases you do this first and *persist* in it until all the vessels are safely tied; then, and not till then, do you slowly relax your pressure. Any surgeon who suggested a "momentary" trial of this measure would be laughed at.

To come back to our first question. In normal labors the uterine muscular compression of the vessels takes place at once. Why, in

such a case as ours, does this not happen? Is it necessary to suppose a haemophilic condition? Not at all; the explanation is much more simple. The uterine muscular fibre is like any other muscular fibre in the body, in that it is capable of fatigue; like the muscular fibre elsewhere, also, it differs at different times and in different persons as to the amount of exertion it can stand short of fatigue. Once fatigued, however, it requires rest before it can again be trusted for efficient work. The leakage must, therefore, be stopped by some other means for a sufficient time to allow of its recuperation, and you see now how absurd it is to keep flogging this tired muscle by ergot, mechanical or electrical stimuli during the period of its exhaustion. You can only get partial, inefficient, and temporary results. The tired uterus, stung into action by squeezing, etc., contracts a little here and relaxes again, while other fibres in another part make another weak attempt. You feel it for a moment, only to find its relaxed parietes falling away again into inertia; meanwhile it, like all the rest of the body, is feeling more and more the drain of blood, and, unless that is stopped by some other power than its own, becomes progressively less able to oppose any barrier at all. In these cases to try for and to depend upon contraction of the uterus as a *primary* check to the bleeding is to lean upon a broken and steadily breaking-down reed.

But while I lay, as I think I have proved, such necessary stress upon the *primary* use of compression, there is still the *secondary* ligation of the vessels to be brought about. No surgeon would trust alone to his compression of the artery. He would also, and as a necessary complement to his primary action, tie the vessels. But secure in his freedom from immediate anxiety, he would no longer rush hysterically from one remedy to another, but proceed in a cool and collected manner in the way best suited to obtain his desired end. Can we imitate him here? Certainly. Inject ergotine, by all means. While your compression is on, this drug can only be taken into the blood ready when the uterine fibre is in proper condition to receive it, to give the *now* effective fillip to its contraction. Compress the uterus with the free hand when it shows signs of recovery. Clear out clots from the vagina and uterus. Give small doses hypodermically of strychnine, apply heat to the trunk, and especially to the head; help to keep the all-important nerve-centres of the respiration and circulation active. Raising the foot of the bed helps to fill the partially-emptied vessels of the superior half of the body through the vena cava, which is easily filled by the vessels of the lower extremities, which can for a while do with less than the normal. The legs may ache for a day or two, feel

numb and uncomfortable, but they soon recover, and these sensations are not worth consideration when opposed to the risks I have tried to delineate to you.

The pressure of which I have spoken should not, however, be always applied to the same spot ; the aorta is covered by the sympathetic plexuses, and these do not well bear continuous pressure. Luckily, there is plenty of space. The abdominal walls just after confinement are in splendid condition for our purpose, and compression, preferably by the ulnar surface of the closed fist, may be applied over four or five inches of the aortic trunk, well up at first, then lower, changing the hand from time to time, but always seeing that the relieving hand is acting before its predecessor is removed. In this way, and especially with the aid of an assistant who can take turn and turn about with you, such pressure can be kept up for several hours if necessary. As a rule, it is not required so long. Half to three-quarters of an hour may be taken as an average ; but however long it may be required, it should never be given up until the uterus is once more found to be contracting of itself, and then only slowly and tentatively.

THE TREATMENT OF FRACTURES OF THE LOWER LIMBS BY MEANS OF "AMBULATORY" BAN- DAGES (GEHVERBÄNDE).

CLINICAL LECTURE DELIVERED AT THE CHARITÉ HOSPITAL.¹

BY A. VON BARDELEBEN, M.D.,

Late professor publ. ord. of Surgery in the University of Berlin; Director of the
Surgical Clinic at the Charité Hospital; Surgeon-General *à la suite*
of the Prussian Army, etc., etc.

GENTLEMEN,—This is the patient with a fracture of the right leg, whom you will remember to have seen at the conclusion of yesterday's clinical lecture. Both of the bones were broken, the tibia in its upper third. I told you then that we were going to place the leg on a Watson's splint for twenty-four hours, and that to-day we should finally set the fracture and put it up in plaster of Paris in such a way as to enable the patient to be up and about while the healing process was at work. This we shall now proceed to do.

In order to insure exact adaptation of the bandage to the configuration of the limb we shall apply the plaster of Paris immediately to the skin itself, after having rubbed the skin with oil to prevent adherence of the hairs. The superfluous oil is wiped off, else it would be sucked up by the bandage and delay the setting of the plaster. If we were first to envelop the limb in protection wrappings of gauze and cotton-wool, in the usual fashion, the leg would be sure to slip and shift its position within its casing when called upon to bear the weight of the body, and displacement of the fragments would be the result. You observe that the patient is allowed to remain on his bed, that he is not placed on the table, and that he is not being put under chloroform. We wish to avoid this, because the muscular relaxation induced, although convenient as long as we are at work, subsequently gives rise to looseness and discomfort of the bandage, when the muscles have resumed their normal shape and tension. You will see that it is quite

¹ Reported by H. Cleves-Symmes, M.D.

feasible to get along without anaesthesia by using the precaution of previously giving a hypodermic injection of morphine, and by quietly leaving the patient where he is, thus avoiding all pain and excitement.

The plaster-of-Paris bandages must be carefully prepared. Every physician should know how this is done. A strip of gauze about five inches in width and between twelve and twenty feet long is spread out on a table, and a heap of finely powdered gypsum of the best quality is evenly distributed and spread over it. Then the bandage is loosely rolled without lifting off the table, being made to travel across to where the other end has remained in its original position. The resulting roller-bandage contains a small but evenly distributed amount of plaster of Paris. Before using it is moistened with hot water. The time required for setting is about ten minutes if limp gauze has been used; starched material would take a much longer time in drying. The gauze should be without a hem, to avoid pressure.

Now you shall see how the bandage is applied. One assistant holds the thigh, while it is the business of another to exercise traction on the foot. In this way it is easy for the operator by a touch or two to get the fragments into the correct position. The foot must be kept flexed on the leg at exactly a right angle, so as to enable the patient afterwards to rest on the sole of the foot; the knee is extended. To the assistant in charge of the foot belongs the most important and difficult *rôle*, for he must keep the foot at exactly the right angle, neither more nor less, else the patient will not be able to properly set it down on the ground. He must not allow the foot to rotate nor to slip downward, else the reduction of the fracture would be spoiled, and, finally, he must be pulling hard all the while that the operator is applying the bandage, besides shifting his hands whenever they come in the surgeon's way. In this position five or six roller-bandages with plaster of Paris are smoothly, evenly, but not tightly applied around the limb from the base of the toes, which are left uncovered, to a point slightly above the knee. It is very important to avoid applying the bandage too tight in such a case on account of the absence of any padding whatever. The bandage is nowhere reversed; if it refuses to run on smoothly it is simply cut off, and the new end applied. The left hand follows every turn of the roller-bandage and smoothes it out in the usual manner.

It has taken five or six minutes to do this, and now, before the plaster has grown too hard, I shall once more carefully review the position of the limb and make what corrections I deem necessary. That is the reason why this first part of the bandage was made so

thin. If I had immediately put on all the material required, I should not now be able to affect changes in the position without ultimately damaging the strength of the apparatus. As it is, I can easily make slight alterations,—in the present case causing the foot to be slightly raised and gentle pressure to be brought to bear on the site of fracture,—and later on, when the plaster of Paris has well set, I can reinforce the bandage, by means of the same or any other material, till it is strong enough to support the patient's weight without danger of bending or breaking. I am then quite sure that the parts are just so placed as I wish them to remain until the completion of repair.

While we are waiting for the gypsum to set, I shall have a few words to say on the history and advantages of this kind of portable apparatus.

Until within the last few years no other principle was recognized but that of keeping broken members at complete rest till the fracture was healed. Some surgeons allowed their patients to be about, but they objected to their putting any strain on the broken limb; they were so particular as to provide a sling or a notched crutch as a support for the bandaged member. And yet there were not wanting observations to show that in fractures of the jaw, the clavicle, and sometimes of the upper extremity, absolute immobility was not always necessary in order to obtain a satisfactory union. Cooper's suggestion, in case of delayed union to allow the patient to get about and use his leg, shows, at any rate, that this cannot have been regarded as a very dangerousfeat, to be sure, at a much later period of treatment. Frequently, no doubt, patients actually did limp about on their own responsibility without the surgeon's knowledge. I vividly remember how I myself, more than thirty years ago, having received a fracture of the ankle with dislocation of the foot, was up and about on the very day after the accident. Nor did I subsequently, while union was being established, ever remain steadily on my couch. But it is only quite recently that this method has been generalized, first by Krause, then by my assistants, Drs. Korsch and Albers, and myself. And yet its advantages are so great! This is not the place to dwell on the ease and convenience or on the benefits of a more substantial nature which the patient thereby enjoys, being enabled to attend to his personal needs and to his business duties. I shall only mention those points that have a strictly medical bearing.

It is plain that there is no chance of bed-sores in the case of a patient who is not obliged to lie longer than he pleases. It is self-evident that muscles which are daily put to use will not become

atrophied. But the beneficent effect of motion on the nutrition of the entire limb goes yet further: the broken bone in the "ambulatory" bandage heals not merely with equal rapidity, but actually more rapidly than under the agency of permanent repose. The whole system of the patient is sensible to this favorable influence: his appetite, his digestion, and his sleep are as good as though nothing were the matter with him. This advantage is very apparent in nervous persons and in patients accustomed to much exercise.

There are two classes of patients that derive the greatest amount of benefit from the new method,—aged persons and drinkers. The former have not to dread an aggravation of the chronic bronchial catarrh, with which they are generally troubled, nor do they run the risk of a low pneumonia; on the contrary, we have noticed many an old bronchitis to disappear during this comparatively active life in the hospital. The drunkard, on the other hand, so long as he is able to indulge in daily exercise, appears to escape the danger of delirium. Delirium tremens so frequently occurs in my wards among the male victims of severe accident that I cannot regard it as a mere chance that I have not one single time met with it in the case of fractures of the lower limb so treated.

The plaster of Paris around our patient's leg has by this time so far set that we may relieve the assistants of their tedious duty. The parts are now maintained in proper relation to each other, but the shell is not sufficiently strong to bear any strain. We might at once reinforce it by another couple of plaster roller-bandages, but I think it will be better to wait until to-morrow, when the bandage will have grown completely dry, and then strengthen it by means of carpenter's glue and pine shavings. This is a very simple matter. The plaster-of-Paris apparatus is painted over with glue and wound round with a cambric roller-bandage. The new surface is again painted with glue, and strips of pine shavings are applied longitudinally and held in place by a few spiral turns of a roller-bandage. The strip behind is carried over the heel as far as the base of the toes; the lateral strips are made to overlap each other underneath the sole of the foot. The surface is again glued, and finally a flannel roller-bandage rather tightly wound over all. It takes about a quarter of an hour to do this, and in twenty-four hours the whole mass has grown dry and hard. It can then be cut open lengthwise, presenting an open elastic capsule exactly moulded to the limb, which latter can be taken out later on to be massaged and put back again, the whole apparatus being held in place by the assistance of a roller-bandage. Besides affording ready access to

the member, this combined plaster-of-Paris-and-glue bandage has the great advantage of being very light and not unnecessarily hampering the patient in his locomotion. If all goes well, the same bandage is left on till union has taken place.

I believe I have mentioned before that this method of applying the stiff bandage to the skin without an intervening layer of soft material necessitates particular watchfulness during the after-treatment. It is only applicable, therefore, where you are able to keep an eye on the patient during that time. If the toes begin to swell, or if they become cyanosed or very cold, and fail to recover upon the foot being placed in an elevated position, then the whole bandage must be removed, it either having been too tight from the very beginning or having grown so in consequence of swelling of the limb. The latter is more rarely the case. If any one particular spot should prove very painful, then we cut a "window" out of the bandage, and, if the skin does not look suspicious, we tampon the opening and close it with plaster of Paris. If we find a blister to have been raised by pressure on the spot, we open it, apply a compress of iodoform gauze, and shut the aperture as before. It has very rarely happened, though, that we have been obliged to relieve complaints of this kind. Precisely in consequence of the *universally* close application of the bandage to the different surfaces, it is not the prominent points, but the gradual slopes that lead up to them that bear the real strain, particularly that of extension and counter-extension. Thus, in our present case the dorsum of the foot and the curving slope of the tibia are the parts where the stiff bandage finds the necessary purchase to hold the fragments apart; in walking the weight by way of the curved tibia surface is transferred to the bandage.

Physicians, visiting this hospital in order to get acquainted with the new method, have frequently expressed their conviction that the leg was bound to swell when the patients walked about thus encased. On the strength of my experience I was able to tell them that they were mistaken. If the bandage is applied before a considerable swelling has formed, none such is developed, not even if the patients are set on their legs the very next day. If there is considerable swelling at the time we put on the plaster of Paris, then we are generally soon obliged to change the bandage, not on account of an increase of the swelling, but, on the contrary, because it has gone down and the apparatus has thereby grown to be too loose-fitting. Still, bearing in mind the dangers of neglect, you had better change your bandage ten times too often than once too seldom.

Our patient will begin his walking exercises the day after to-morrow, when his bandage is finally completed. We do not, as a rule, experience any difficulty in inducing our patients to trust themselves to their apparatus with the assistance of a pair of crutches. The power of example does a great deal, and when the patient finds one or several fellow-sufferers in his ward moving about nimbly and fearlessly using their stiff bandage as a boot, he takes heart and does likewise, even though at first the idea of such a thing seemed preposterous. Soon one crutch and then the other is discarded for a cane as union establishes itself. I have even known courageous patients after a few days to dispense with the use of an artificial support. When union has finally taken place, which we may easily ascertain by removing the elastic capsule from time to time, the bandage is left off altogether, and the patients forthwith proceed to get about without any difficulty. It is not as if they had been confined to a couch ; there is no marked wasting of the muscles, no pronounced stiffness about the joints, no defective circulation and tendency to oedema in the limb. The joints, unless they were previously affected or involved in the accident, are never stiff afterwards to any degree worth mentioning. Frequent massage, of course, tends to produce these good results.

It is not always necessary in fractures below the knee to carry the bandage beyond the joint ; we do so only where the fracture involves the upper third of the bone, or where the extravasation of blood extends to the knee, or where the joint itself has suffered. In the latter case, if there is effusion within the synovial cavity, we puncture the joint and draw the fluid off by aspiration before putting up the limb in plaster of Paris. In cases of fracture at a lower level the bandage extends no farther than just below the knee, embracing the upper end of the tibia and fibula. After what I have told you before, you will readily understand that this is quite sufficient to hold the fragments in place.

The same principle of treatment has been successfully employed for the last three years in fractures of the thigh. I shall describe the method to you in a few words. First, the leg from the base of the toes to just below the knee is put up in plaster, just as in the case of to-day's patient, with this difference, that the knee is left free. When this bandage has set and grown hard, then one assistant takes hold of it, another seizes the patient around the chest ; the first man makes extension by steadily drawing until the ends of the bone are opposite one another. Now comes the third act of the operation. While these assistants maintain their position and exercise traction, a plaster-of-

Paris dressing, consisting of a twenty-foot bandage eight inches wide folded in lengths of two and a half feet, is moistened with hot water, spread out smooth, its upper border turned down outward, and the

strip thus prepared is laid round the upper end of the thigh from behind, its middle resting on the ischial tuberosity. The medial end is carried horizontally round the thigh to the front, the lateral end being made to travel upward in an oblique direction, following the gluteal fold and with its upper border approaching the anterior superior spine of the ilium, while its inferior border overlaps the horizontal medial end. By means of slight traction at its ends the strip is thus held in place until it has somewhat hardened, whereupon the upper border is bent outward slightly over the tuber ischii, affording a broad support and a kind of seat, in which the body is to rest when the patient stands upright. Finally the ring around the thigh and the bandage around the leg are united by plaster-of-Paris roller-bandages, and the whole apparatus is thus completed. When it has set, no sooner, the assistants cease making extension, the cushion is removed from beneath the pelvis, the patient is suffered to lie back in bed, and the bandaged leg is evenly supported by cushions. In a day or two, if there is no swelling, etc., the patient begins to get about.

Application of plaster-of-Paris bandage in the ambulatory treatment of fracture of the femur.

ALBUMINURIA AND ECLAMPSIA, WITH SPECIAL REFERENCE TO TREATMENT.

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THE association of albuminuria with pregnancy must always be considered a complication of grave importance. True, it may occur without any outward symptoms being manifested, even though a large quantity of albumen be present, but so often does it culminate in the development of convulsions, which in a large proportion of cases cause the death of the patient, that its coexistence must on every occasion be strongly combated even when but a trace is detected.

With regard to the cause of their frequent coexistence, there is perhaps no pathological problem in obstetrics which has had bestowed upon it the same amount of arduous work, and at the same time given rise to more ingenious and elaborate theories.

It has been debited to altered blood conditions, to vasomotor changes, to actual pressure on the urinary organs, and to increased intra-abdominal pressure impeding the renal circulation.

Each theory has its strong partisans, and in individual cases more than a superficial argument may be advanced in support of one or other contention. Yet, when the subject is viewed in a general and practical light, it is evident that an exhaustive etiology is yet unknown, and the simple general statement can alone be accepted,—viz., that albuminuria is in many cases a direct result of pregnancy, and the latter must be recognized as both a predisposing and exciting cause.

An interesting case which strongly negatives the much-supported intra-abdominal pressure theory occurred in my own experience, when I removed from a patient a very large ovarian tumor, bigger than a full-time pregnancy, associated with which there was no trace of albumen in the urine. As the patient was engaged to be married, I decided to risk leaving the other ovary, which appeared healthy; she

subsequently became pregnant, and developed severe albuminuria, with eclamptic seizures, during the ninth month of gestation, and she has since had a second child without any reappearance of the albuminuria.

As the causes, therefore, are but theoretical, it is incumbent in a practical communication such as this to pass from them without further comment.

Albuminuria of varying degree, and resulting from a large variety of causes, very frequently accompanies pregnancy. It has been variously estimated by different investigators, and statistics varying from two and six-tenths per cent. to twenty per cent. of all cases of pregnancy have been stated.

In the large proportion of cases it is trivial, accidental, or transient, and by no means due to the pregnancy; but in a small number, probably about two and a half per cent., it must be looked upon as dependent on the gravid state and of grave moment. ("True Albuminuria of Pregnancy.")

During labor the percentage of cases of albuminuria is largely increased, and may, within easy bounds, be stated at twenty per cent.

As is well known, it is much more common with first pregnancies, and, if the kidneys be not diseased, has little or no tendency to recur in future gestations. We must therefore indisputably consider primiparity to be by far the most frequent existing cause of the condition.

True albuminuria of pregnancy develops in the great majority of cases during the later months of gestation, although it would appear that the earlier it develops the graver is the prognosis. This is probably due to the early appearance in cases of pre-existing kidney-disease.

Diagnosis.—Albuminuria is always of an aggravated character before symptoms of its presence show themselves; indeed, in many instances the first recognized indication of its presence is the occurrence of a uræmic convulsion.

Usually, for some days or weeks before such a grave development ensues the patient complains of headache, difficulty in opening the eyes in the morning due to swelling of the eyelids, and frequently she suffers from sickness and vomiting. The hands and face will also in most cases be found to be puffy and oedematous, while the immediate approach of convulsions is usually heralded by some aberration of the special senses, such as passing blindness, amblyopia, deafness, loss of memory, or temporary aphasia. The urine, if now examined, will be found to turn solid on boiling.

From the important fact that eclampsia may occur without pre-

vious symptomatic warning, and is so much more frequently met with in primiparæ, it is the duty of every *accoucheur* to test at intervals the urine of all primiparæ during the later months of pregnancy.

Prognosis.—The prognosis of albuminuria and pregnancy varies chiefly according to the amount and character of the albumen found, and whether or not any pre-existing kidney lesion prevailed.

When small in amount and without any history of pre-existing renal disease, little danger is to be anticipated, though strenuous endeavors for its removal must be made. If pre-existing kidney mischief be recorded, the prognosis is much more unfavorable, as the renal disease tends to increase, and is much less amenable to treatment than the simple albuminuria of pregnancy. It is, however, when the oedema and other symptoms of renal insufficiency show themselves that the prognosis is most anxious. The character of the urine is now of the greatest value. When boiled and treated with nitric or picric acid a finely-coagulated or a coarse, lumpy, albuminous deposit may be found. If the former, the condition is nearly always quickly amenable to treatment, while with the latter much depends on the number of tube-casts (granular and hyaline), and the percentage of urea as indicating the extent of the kidney mischief.

The premature termination of pregnancy, the result of severe albuminuria, is common; thus the foetal prognosis is unfavorable. The latter results from two causes,—intra-uterine death and premature expulsion. Death of the foetus *in utero* must be considered as favorable to the mother, for after its occurrence the albuminuria usually at once diminishes, and may even entirely cease, though expulsion may not occur for weeks afterwards.

The permanence of kidney-disease originating with the albuminuria of pregnancy is stated to be common, but in an experience of ten cases of eclampsia during pregnancy in primiparæ I have never yet seen one in which the renal disease persisted.

The recurrence of albuminuria in a future pregnancy where no kidney lesion persists is extremely rare. In one case in my own experience where eclampsia and expulsion of the ovum occurred at the sixth month, in a primipara, a future full-time pregnancy was passed through without a trace of albumen in the urine.

The much-dreaded culmination of albuminuria and pregnancy is the supervention of convulsions (eclampsia). In what proportion of albuminuric cases this occurs it is impossible to determine, but general statistics show it to occur in about one in four hundred cases of pregnancy.

As in the case of albuminuria, the exact physiology of eclamptic fits is still *sub judice*. That they are the result of renal insufficiency, and are associated with a poisoned state of the blood and high arterial tension, there is no gainsaying, but further explanations are as yet theoretical and unsatisfactory.

Accidental convulsions arising from epilepsy, intracranial hemorrhage, etc., may also be met with, and have been confounded with eclampsia; but it may be laid down that true eclampsia is a condition due to renal insufficiency and associated with albuminuria,—in fact, is uræmia.

Eclamptic fits, like the albuminuria with which they are associated, are most commonly met with during labor, but may develop during pregnancy or in the puerperium. The statistics of three hundred and sixteen cases show sixty-two during pregnancy, one hundred and ninety during labor, and sixty-four during the puerperium.

The mortality from eclampsia may be said to be about twenty-five per cent.

When convulsions occur during pregnancy uterine contractions are prone to be stimulated, although by prompt treatment the fits may be averted and pregnancy proceed. Should uterine contractions occur, fits usually continue till the expulsion of the ovum is completed, a circumstance probably due to the uterine pains raising the arterial tension, and thus increasing the already high blood-pressure.

Treatment.—The treatment of albuminuria is, for practical purposes, best described by dividing the methods into dietetic, medicinal, surgical, and obstetric. Of all the dietetic is undoubtedly the most satisfactory, and consists simply in the strict enforcement of milk. In a great majority of cases this, and this alone, suffices to entirely remove the albumen, and its effect is frequently astonishing. In its adoption the rigid exclusion of all other diet for at least a short period cannot be too forcibly impressed, while at least four quarts of milk must be consumed daily. On this diet I have been enabled to successfully carry a patient to full time who developed an eclamptic seizure at the middle of the sixth calendar month. In initiating the treatment it is well, if symptoms are not urgent, to slowly accustom the patient to the somewhat meagre fare, other articles of diet being gradually dispensed with. After the albumen has entirely disappeared for some days an attempt at return to normal feeding may be gradually made, but should the albumen reappear, milk must again be made the sole nourishment. Though irksome at first, the milk diet is usually well borne, and even enjoyed, and is most pleasantly borne by

drinking a tumblerful at irregular intervals. Though four quarts has been stated as the minimum quantity, it is advisable that more be taken; beyond that quantity it may be taken *ad libitum*.

The medicinal treatment of simple albuminuria is seldom called for if a strict milk diet be adhered to, but in some cases benefit may accrue from the use of diuretics.

It is, however, when convulsions occur that medicinal agents are specially called for, and in this relation the two drugs which in my own experience have proved of greatest value are pilocarpine and chloral,—the first as a rapid sudorific, and the second from its vascular depressant and reflex sedative action.

If the accepted theory of the causation of eclampsia be correct,—viz., that it is a poisoned state of the blood, associated with high arterial tension,—then, physiologically, in these two drugs we have a direct means of combating the condition. The pilocarpine helps to eliminate the poison through the skin, and the chloral diminishes the vascular tension, while at the same time its action as a nerve-sedative must act favorably. By their administration I have been enabled in four out of seven cases of eclampsia during pregnancy to ward off further convulsions. The method I have adopted is to at once inject one-third to one-half grain of pilocarpine subcutaneously, and administer fifteen grains of chloral by the mouth, or forty grains by rectum; then cover the patient with four or five pairs of blankets, and surround her with hot-water bottles. In less than five minutes intense diaphoresis ensues. Should fits continue, in an hour another similar dose of pilocarpine may be injected, and the chloral continued,—ten grains hourly for five hours. A drop of croton oil on a small piece of sugar may also be given, so that by subsequent purging more of the poison may be excreted, and the deficient action of the kidneys thus assisted. Should the fits cease, the patient is now to be treated as an ordinary case of albuminuria, by simple exclusive milk-dieting.

The diminution of the albuminuria through the profuse sweating is remarkable, as the urine which is solid on boiling at the time of the convulsions in the course of twelve hours may show but a third albumen, and in forty-eight hours occasionally shows but a trace. The use of pilocarpine has been much decried by some authors as dangerous, through causing pulmonary oedema; such, however, has never been my unhappy experience. Its oxytocic effect I have also failed to observe.

Surgical Treatment.—This is almost confined to bloodletting, and in the hands of many eminent *accoucheurs* has met with much success.

It has been tried almost entirely in cases where convulsions have supervened, and its salutary effect is probably due to the relief of vascular tension ; but it is only to be recommended where the medicinal treatment before described fails, as it so reduces the patient that, should the fits cease without expulsion of the uterine contents, the continuance of the pregnancy is of doubtful benefit. In the eclampsia of labor, however, it is of greater value, as the albuminuria is not liable to continue so long through the puerperium, and prolonged milk diet is therefore unnecessary.

Obstetrical Treatment.—This, for practical purposes, may be most conveniently considered in the following manner :

1. The treatment of the albuminuria of pregnancy.
2. The treatment of eclampsia during pregnancy, with and without associated uterine expulsive efforts.
3. The treatment of eclampsia during labor.

In the simple albuminuria of pregnancy it is still an open question among obstetricians whether or not premature labor should be induced. To lay down any general rule on this subject must be erroneous ; each individual case must be considered on its own merits. As has already been shown, albuminuria of the most aggravated extent, and associated with fits and intense œdema, may not only be entirely removed by simple milk diet, and the patient delivered normally at term, but even in some cases an uncomplicated delivery may take place with the urine turning solid on boiling and marked œdema present. On the other hand, we know that violent, uncontrollable convulsions may ensue which result in the death of the patient. To discriminate therefore as to the advisability of inducing labor we must entirely confine ourselves to the amount and condition of the urine as regards tube-casts, and the amount of urea it contains. Should casts be numerous, and the urea relatively much diminished, the induction of labor is more urgently indicated. This is only to be performed after the patient has been put in a more satisfactory condition by means of the medicinal and dietetic treatment before described. The same line of treatment should also be observed with cases in which actual convulsion fits have taken place. In four such cases in which fits occurred at a period varying from the sixth and one-half to the eighth and one-half month of pregnancy I have been enabled to tide the patient over to full time, and the labor has been completed normally. Should emptying of the uterus be decided on, the method of its performance is also of great importance, and our endeavors should be directed to a method free from uterine contractions, and as rapid as is consistent

with safety. The avoidance of uterine contractions must be considered of prime importance, as during pains arterial tension is much raised, and the tendency to convulsive fits is increased. A method of operating which I have found eminently satisfactory has been by the adoption of Champetier de Ribe's dilator. After rupturing the membranes and introducing the bag, I carefully but rapidly dilate the cervix by pulling on the bag, and at the same time sweeping the finger round between it and the cervix. In this manner, in three cases successfully operated on, I have been enabled to fully dilate the cervix in less than ninety minutes, and at the same time without inducing, as far as could be observed, a single uterine contraction. After dilatation of the cervix the completion of the delivery by forceps can conveniently be performed.

In cases where eclampsia is associated with uterine pains it is useless to temporize, and delivery must be accomplished as rapidly as is consistent with safety, and by the method which is best suited to the individual case. At the same time much may be done to counteract the severity of the fits by deep chloroform anaesthesia, and the use of chloral and pilocarpine as previously indicated.

In conclusion I might shortly summarize the points of practical interest which it has been my endeavor to succinctly express. They are as follows :

1. From its association with convulsions, albuminuria with pregnancy must be always considered of grave importance and energetically treated.
2. Pregnancy is a distinct cause of albuminuria, primiparity being exceptionally prone to its production.
3. An attack of eclamptic convulsions is frequently the first indication of the presence of albuminuria, thus necessitating the consistent examination of the urine of all primiparæ, in the later months especially.
4. The prognosis depends greatly on the pre-existence of renal mischief, and on the character of the urine as regards tube-casts and the relative amount of urea.
5. In all cases where albuminuria is present a rigid milk diet must be enforced.
6. If fits occur, they should be treated by pilocarpine and chloral.
7. If fits occur without uterine expulsive efforts, an attempt should be made to control the fits and allow pregnancy to continue, but should they persist in spite of treatment, rapid expulsion of the uterine contents should be brought about.

8. The induction of premature labor is justified when, from the character of the urine, active renal disease is found to be present.
9. The induction of labor may be satisfactorily performed by Champetier de Ribe's bag, and should be completed as rapidly as is consistent with safety, and with the avoidance of uterine contractions.
10. If uterine contractions are present along with fits, labor should in all cases be completed as rapidly as possible, in the manner best adapted for each individual case.

THE TREATMENT OF PUPERAL INFECTION.

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To understand fully the indications underlying the treatment of puerperal infection we should be able to second nature's efforts to remedy this condition when present, and it is well to recall therefore how the human economy defends itself physiologically after the puerperium. *First*, the interior of the uterus is protected from the invasion of microbes by the complete occlusion of the vagina, whose walls become closely adapted to one another. In addition to this the normal secretions of the os uteri form a plug of mucus which closes the orifice of the uterus. *Second*, the normal secretions of the uterus have an acid reaction which is always a poor culture medium for microbes. *Third*, the lochial discharges after confinement prevent any stagnation of micro-organisms in the parts. *Fourth*, the presence of septic germs in the uterine wall causes an abundant diapedesis of leucocytes, and these elements act as germ-destroying cells, attacking the microbes and rendering them inert. *Fifth*, the septic micro-organisms and their toxines are destroyed in the human economy by the antiseptic action of the tissues and the blood serum. Now, in order to assist nature in her efforts to overcome or prevent puerperal infection we should endeavor therefore to aid these natural efforts to the best of our ability.

To prevent the entrance of microbes into the genital passages is a process of asepsis, while the transforming of the genital organs into a poor culture ground becomes a process of antisepsis. Most of the obstetricians of France are in favor of antisepsis, while in Germany there are two schools, the one practising asepsis, and the other both asepsis and antisepsis. In following the former method the obstetrician is careful to see that his instruments, hands, and everything that touches the patient, as well as the external genitalia, are absolutely clean. The believers in this method agree with Schroeder that in a healthy woman there are no pathogenic microbes present in her genito-

urinary tract. On the other hand, Doderlein, Bumm, and others have shown that these microbes do exist in the healthy woman, and these writers believe that the method of antisepsis is best. In following the latter method substances are introduced into the vagina and uterus by which micro-organisms may be destroyed. In regard to the etiology of puerperal infection it has been shown that a number of cases have their source of infection without the genital tract, but, on the other hand, there are a number of examples of infection within the genital tract. Semmelweiss has shown the truth of this in the middle of this century, and for our part we admit the possibility of auto-infection and are strongly in favor of antisepsis.

In Germany since 1890 the practice of giving injections of anti-septic solutions before, during, and after confinement has been largely abandoned, except in cases of proved infection. Leopold in 1890 commenced to keep a record of his statistics while practising his method of asepsis, and found that his mortality was only five per cent., whereas among similar cases he had had a mortality of twenty per cent. with vaginal disinfections. In his recommendations for the treatment of the several stages of labor he forbids all vaginal examinations, and advises that the confinement be directed by external manipulations alone. It is difficult to see how the position of the umbilical cord may be accurately determined under this method. Rectal examinations have been recommended by some authors, such as Kronig, Ries, and others. Schwartz at the Charité Hospital, in Berlin, secured a mortality of only four per cent., while Ferruta, in Florence, had a mortality of five per cent. Both of these writers used asepsis alone. Frommel, at Erlangen, when he abandoned antisepsis saw his mortality rise from eight to eleven per cent. While this is not a very great difference, this obstetrician was much annoyed to find that a woman who came into his service in perfect health died in the hospital from puerperal infection. Ahlfeld was also induced by Leopold to abandon antisepsis for asepsis, and it was not long before he had cases similar to that reported by Frommel. They have both, therefore, returned to antiseptic methods. It would seem that the objections to the antiseptic method are not well founded, and it has been urged that the canula itself introduces microbes and causes excoriations of the vaginal walls. In our hospital, however, we employ glass tubes which have an olive-shaped head for vaginal injections, and we never use any force in their introduction. Let me urge you, therefore, to practise the method of antisepsis, if for no other reason than to escape the remorse of conscience which a death by puerperal infection will cause you. Do not

hesitate to use antiseptic methods as a preventive measure in the last days of pregnancy and during confinement. The best antiseptic solution for vaginal injections is a solution of corrosive sublimate of the strength of one to four thousand.

Let us leave the consideration of preventive measures for the present, and pass on to a consideration of the treatment of a case of puerperal infection. When the uterine cavity has become infected by the presence of pathogenic organisms we should direct our treatment to assisting nature in her efforts to free the organism from the toxic action of these microbes. We should therefore assist the action of the lochial discharges and also endeavor to destroy the germs *in situ*, and transform the uterine cavity into a bad or at least an unfavorable culture medium. A case like the following may present itself to you. Either there have been microbes present in the uterus for some time without any manifestation of their presence or else septicæmia and its accompanying phenomena have developed. In the first case, perhaps, the labor has been a long and difficult one with a premature rupture of the membranes, or the child has presented in a position necessitating version with or without the application of forceps. Or, again, septic germs may have been introduced by the obstetrician ignorant or careless of the laws of asepsis. Or the foetus may have been born dead, and you naturally dread the development of puerperal infection. In such cases do not delay a moment to apply prophylactic measures of intra-uterine injections immediately after labor. In giving these no special instruments are necessary, unless it be the glass bulb with three perforations at the extremity which you will find especially useful. Very little pressure should be used in giving the douche, the fountain syringe being held not more than two or three feet above the level of the bed.

Tissier has shown that if the pressure be greater than this the liquid is apt to cause toxic symptoms. Injections made with great force are not only dangerous in this way, but also by their reflex action may cause fainting or delirium, or even convulsions. Care should be taken to express all air from the canula before using it, as cases of death have occurred upon the introduction of air into the uterine sinuses and thence into the venous circulation. Another precaution which it is wise to adopt in washing out the relaxed and still distended uterus is to apply the hand over the fundus uteri in order not so much to close the Fallopian tubes and prevent the entrance of liquid into the abdominal cavity as to support the walls of the sinuses and the mouths of the veins which are still distended and gaping. Such a precaution

will prevent the absorption of too much of the corrosive sublimate solution and thus reduce the risk of poisoning by it. If you wish to employ uterine irrigation either before labor has commenced or at a later period after the confinement is over, then the ordinary glass canula, as described, will not answer. It will be necessary to employ the Bozeman-Tarnier-Doleris canula or Budin's special canula, and adopt all the precautions which have been already recommended.

The question is now what would be the best substance to use for these injections. Professor Tissier, after a long series of experiments on the relative value of drugs which may be employed for this purpose, has found corrosive sublimate to be one of the best, if not the best, but those employing it should be careful how they use the drug. There can be no question that this drug is better able to destroy the microbes than any other which can be used. Be careful to see that the os uteri is well opened and that it will allow the free return of the liquid used. An injection of from three to four quarts of a solution of a strength of one to ten thousand should be employed, and it is well never to use more than this quantity or employ stronger solutions. As a rule, you will get good results even when the walls of the uterus have become infected with the microbes.

If the uterine walls have become invaded by septic germs and symptoms of septicæmia have been present for several days, solutions of corrosive sublimate are not then the best to employ, as there are others which are more efficient. It has been found that solutions of corrosive sublimate retard the diapedesis of the white blood-copuscules and have the property of coagulating albuminous substances. While, therefore, it is true that the germs with which this solution comes in contact are directly killed, it is at the same time very apt to interfere with the action of the white blood-corpuscles, and thus deprive the natural processes of a valuable auxiliary. In the same way carbolic acid solutions are useful when employed in a solution of two per cent., but this solution has a caustic action, and is toxic even at that strength. The same may be said of solutions of sulphate of copper. For this reason, therefore, it is better to employ for disinfection of the puerperal uterus either iodine, permanganate of potash, iodoform, or pheno-salyl. Iodine when employed should be used in the strength of three to one thousand. The following formula will be found a useful one:

BOSTON

Iodine, 8 grammes (gr. xlv);
Potassium iodide, 5 grammes (gr. lxxv);
Sterilized water, 100 grammes, q. s. 3iiss.
Sig. Add to a quart of sterilized water.

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The advantages of the latter solution are, in the first place, that it is as antiseptic as corrosive sublimate in the strength of one to four thousand ; second, it is non-poisonous ; third, it is diffusible, entering the uterine walls and destroying the microbes even in the muscular tissues ; fourth, it increases the number of leucocytes on the interior of the uterus. In this connection we have often seen a tremendous increase of the purulent lochial discharge following its use. Permanganate of potash is also an excellent disinfectant. It is less energetic, however, than iodide, and it destroys the putrid germs probably by oxidation. Pheno-saryl has been employed by Dr. Christmas in a large number of cases, and he finds that a solution of one per cent. is as active as carbolic acid in a strength of five per cent. While iodoform has been found useful in certain cases, it is not altogether to be depended upon, and there is considerable danger of poisoning attending its use. Boric acid is a dangerous agent, because it gives a false feeling of security when employed as an antiseptic agent and does not do the slightest good.

In the treatment of a case of puerperal infection of the interior of the uterus, or, in other words, puerperal metritis, the wisest plan is to commence by washing out the vagina with a corrosive sublimate solution one to four thousand, and then make a uterine injection of permanganate of potash (1 to 1000). If this course of treatment does not control the symptoms in a few hours, then resort to the iodine solution. The injections should be made intermittently, and not continuously, as some have recommended. If both of these remedial measures fail and the hyperæmia of the uterus persists, it is then well to resort to a method of cleaning out the uterus by friction. Take a long pair of uterine forceps with a small wad of cotton on which has been placed a solution of iodine and chloride of zinc, of the strength of one to ten, or a solution of carbolic acid, from five to ten per cent. With this cotton rub the interior of the uterus and endeavor to detach any false membranes which may be there and thoroughly sterilize the cavity. Having failed even with this procedure, it is well then to resort to the use of the curette. The operation of curetting must be performed with great care, as the uterus is very soft during involution and perforation is very liable to occur. The best curette to employ is of a rounded form with its border presenting a number of slight depressions or serrations, as it has been found that the smooth curette will not readily take hold of and detach the placenta. Such a curette should be allowed to rest on the uterine walls with no greater pressure than is exerted by its own weight, and it should not be pushed with any force

at all, simply scraping the inner surface of the uterus from above downward. Having performed this thorough curetting of the interior of the uterus, it is well to carefully swab out the interior of the viscera with a ten-per-cent. chloride of zinc solution. Then wash out the cavity with an iodine solution or else apply a tampon of iodoform gauze that may be saturated also with a chloride of zinc solution. This procedure may be repeated the next day if the case has not greatly improved.

When not only the uterus and its appendages but the peritoneum and the pelvic cellular tissues as well are attacked, the course of treatment then to be pursued is somewhat different. The removal of the diseased uterus has been recommended by such investigators as Skutsch, in Germany, Polk and Smith, in America. These operators have performed several successful operations for this condition, and in the practice of obstetricians certain cases will occur in which this radical procedure is to be recommended. It will not do to allow patients to die without at least trying this last resort. It is poor surgery to simply puncture the abdominal walls and then to flush out the abdominal cavity through a large trocar and canula, and it is much more advisable and rational to make an incision of from four to five inches long through the abdominal wall, introduce a long canula, and then to wash out the abdominal cavity with a corrosive sublimate solution of one to twenty thousand. Out of ten cases operated upon by Dr. Bouilly two were successful, while Dr. Parish claimed seven successful operations out of eight performed. The latter operator, however, proceeded at once to radical measures as soon as signs of peritonitis had developed.

Let us now briefly review the general treatment of these cases with a view to aiding the action of the excretory organs and maintaining the strength of the patient. The products of septic infection, it is well to remember, are removed from the system either by discharges from the bowels or by the urine and perspiration. Therefore in a case of septic metritis, if diarrhoea is present, do not attempt to check it, but content yourselves with the administration of some internal antiseptic, such as benzo-naphthol, salol, or salicylate of bismuth. At the same time it is well to aid diuresis by a milk diet and friction of the skin, or even by hot baths. One of the best agents to employ for its direct toxic property upon the germs is mercury, and calomel is an excellent form in which to employ it. This salt stimulates the liver and increases its property of killing germs. It will, moreover, disinfect the intestines. It should be given in doses of seven or eight grains and repeated in four hours on the first day of treatment. The second day

of treatment seven-tenths of a grain of calomel should be given every two hours. In Germany it is the custom to employ inunctions of mercurial ointment at the same time, but we do not approve of this method and seldom resort to it.

To support the general system of the patient small doses of alcohol and sulphate of quinine will be found useful. Champagne, if given, should be administered in small quantities, as it is very liable to upset the digestion. The dose of quinine should be only five grains three times a day, as it is also apt to disturb the digestion in larger doses. In conjunction with these supporting measures the patient should be given those forms of food which are most readily assimilated, such as milk, soup, eggs, beef, peptonoids, and black coffee.

If, in addition to the measures which have been already described, it is possible to increase the power of the tissues and the blood to resist the action of the microbes by any other means, it is well to consider such a method. Artificially prepared serum has in certain other infectious diseases aided materially in the destruction of the invading microbes, and greatly assisted nature in her efforts to throw off their effects. In two cases we have resorted to the following formula as recommended by Hayem and found it to be fairly successful :

R. Sulphate of sodium, 10 grammes (3iiss);
Chloride of sodium, 5 grammes (gr. lxxv);
Sterilized water, 1000 grammes (Oii). M.
Sig.—For hypodermic use.

This solution was employed by us in doses of forty grammes (about an ounce and a half) given twice a day hypodermically, and we found that this method of treatment is well worth a trial.

In closing our remarks on this subject let us refer to the experiments of Roger and Mironow. The first of these observers prepared cultures of the streptococcus in which he precipitated the toxalbumins with alcohol, and he injected the filtered liquid into animals, which were thus rendered immune to disease. Mironow arrived at the same result by a series of vaccinations with cultures of a strength which was carefully graduated. He then took the serum of these animals and, having injected it into others, found that they were thus rendered immune to any action of the streptococcus. While these interesting experiments in bacteriology have not as yet led to results which can be employed practically in the treatment of puerperal infection, they are at least deserving of attention by those gynaecologists and obstetricians whose aim it is to keep in the front rank of their profession.

THE TREATMENT OF CHRONIC ENDOMETRITIS.

CLINICAL LECTURE DELIVERED AT THE KENTUCKY SCHOOL OF MEDICINE HOSPITAL.

BY WILLIAM H. WATHEN, M.D., LL.D.,

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GENTLEMEN.—The patient upon whom I will operate in a few minutes has been examined by my assistant, who diagnosticated chronic endometritis, with severe dysmenorrhœa following the birth of a child three years ago. She is nineteen years of age, has had but one child, and was a healthy girl until after its birth. Since then she has had a profuse, offensive, leucorrhœal discharge; has had painful menstruation at each period, with pressure deep down in the pelvis; soreness over the lower part of the abdomen, especially in the inguinal regions, with nervousness, headache, backache, and the various nervous manifestations characteristic of the condition diagnosticated. We will anæsthetize her, dilate the cervical canal, and curette the cavity of the uterus thoroughly but carefully, leaving no diseased condition. We will then irrigate the cavity with bichloride of mercury one to two thousand or one to three thousand, and tampon with iodoform gauze. She will then be kept in bed from three to five days, and in two weeks go back to her work. She has been bathed, has had a vaginal douche, and the bowels have been moved; but before beginning the dilatation and the operation we will again cleanse the vagina with soap and hot water, using absorbent cotton, with a finger or pair of forceps, so that before the operation is begun the vagina and the vulva will be made surgically clean, and no sepsis can be conveyed through anything that we may use in the operation. In curetting, the patient, the instruments, and everything to be used in the operation, should be sterilized with

the same care that we would observe in doing a laparotomy, and in cases such as the one before us, use a sharp curette. Septic pelvic peritonitis or cellulitis and tubal disease following this operation are because of ignorance or neglect upon the part of the operator. He takes his patient as he finds her, probably gives her a vaginal douche ; he may even give a bichloride douche, and, without carefully washing his hands or sterilizing his instruments, imagines that he is doing an aseptic operation, whereas he is conveying to the uterine cavity more poison than he is taking away, and opening channels through which septic matter may be conveyed into the folds of the broad ligaments or into the peritoneum through the lymphatics and other vessels, and in this way you can understand that he does more harm than good. The operation with a blunt curette in cases of this kind, while it is practised by some operators, is worse than no operation. Following these operations there should be no inflammation, and there will be none if they are performed correctly.

The patient is now anæsthetized, all instruments and the hands of the operator and assistants have been thoroughly cleansed ; so we will cleanse the vagina, perform the operation, and do so without the aid of a speculum, and with but few instruments, after which we will briefly discuss the subject of curetting, because it is important that each of you should know everything about it, and should be prepared to do this work. After a patient has been placed under the influence of the anæsthetic always be sure to make a thorough examination to find out the extent of the trouble, because this can be done more easily under anæsthesia than before, and the patient does not suffer as she usually will if you make a thorough bimanual examination without an anæsthetic. Her uterus is in its normal position, but the sensation to the finger in contact with the cervix and os uteri indicates the destruction of the epithelium covering the cervix and extending up the cervical canal. Upon the right side everything appears to be in a healthy condition ; upon the left side there is either an enlarged and adherent ovary, a pus-tube, or an intraligamentous cyst, but that will not interfere with curetting, because we will do so very carefully, and at a subsequent operation, if the patient consents, we will remove this tumor. We cannot do so now for the reason that she has not been told of the nature of the tumor, and it is not the correct thing to perform any operation upon a patient until the full significance of the operation has been explained to the patient or to the immediate friends. Withdrawing the examining finger, an offensive puro-sanguineous discharge comes from the uterus. Having again washed the vagina and the vulva thoroughly with soap-

and water, we will complete the cleansing process with cotton wet with a one to five hundred bichloride of mercury solution, to be sure that the parts are in proper condition. With two fingers in the vagina to serve as a speculum, we catch the anterior part of the cervix with a pair of bullet forceps, perfectly exposing, as you see, the neck of the uterus. A speculum is not necessary in this operation, and, in fact, it is only in the way. We will dilate with a medium-sized dilator, not using Wathen's large one, because it is unnecessary, as but little dilatation is required. The dilatation has now been made sufficient, and we will with this sharp curette scrape away the endometrium and also the lining membrane of the uterine canal. You will observe there is very little bleeding. If you operate, however, in a case where there is a septic condition following labor or abortion, the uterus is usually very soft and you may have a great deal of hemorrhage. In cases such as the one before us, the hemorrhage is seldom enough to concern us. The depth of the uterus is four inches. I am curetting with all the care possible, otherwise I might force the curette through the uterine wall into the peritoneal cavity, and in that event, if the tissues that I am scraping away are septic, this woman might die of peritonitis. You should always be careful and not use much force; it is not necessary, and does no good, as but little force is required. Having now curetted the uterine cavity and cervix, I am irrigating the uterine cavity as thoroughly as possible, being careful that none of the bichloride solution gets out through the Fallopian tubes into the abdominal cavity, as might occur if we have no return flow. Having irrigated, we will wash away the blood and *débris*, wiping the vagina with sterilized cotton. You see the character of the scrapings we have removed, showing the necessity of curetting. The vagina having been cleansed of blood, we throw a sterilized towel over the buttocks, and pack iodoform gauze gently into the uterine cavity, and also in the cervical canal. We place another piece of gauze in the vagina, and you must remember when you take out the gauze that there is one piece in the vagina resting against the cervix and another piece well in the uterus. She is thoroughly cleansed, and everything has been done that is necessary without endangering her in any way.

As to the question of tamponing the uterine cavity after curetting, the profession has not decided definitely and positively. I tampon lightly with iodoform gauze because it makes a good drain, it holds open to a certain extent the neck of the uterus, and the iodoform may prevent the multiplication of pathogenic bacteria, if any are left in the uterus. There are operators who contend that we ought not to tampon

in these cases ; that tamponing interferes with drainage ; that it does no good and may do harm. I have seen no harm resulting from tamponing, and I fancy that I have had many good results. Many cases treated in this way have been cured of inflammation of the uterus, and have also had no further dysmenorrhœa. So long as the results are nearly perfect by the method of tamponing with iodoform gauze I expect to continue to do so until I am convinced that something else is better. We must be very careful in the selection of cases for curetting, otherwise we may not only do mischief but we may cause the death of our patient. A few years ago the craze of curetting every case of sepsis of the uterus following labor at term or an abortion became very general, because of the belief that we could at once prevent the further development of sepsis ; but it was very soon discovered that the results were not uniformly good ; that the patients did not always improve ; that sepsis continued and sometimes increased more rapidly than before the operation, and that the uterine tissues were so soft that the curette would go through the walls easily into the peritoneal cavity if used with enough force to scrape away the diseased endometrium. Moreover, as the uterus was filled with the most virulent septic germs, there was an inroad established into the peritoneal cavity, and in a little while we had septic peritonitis or general sepsis, and shortly afterwards the death of our patient. So that now the most experienced operators in gynaecology decline to curette in most cases of sepsis following labor or abortion. If you have a retained placenta, or parts of a placenta, after an abortion, with a foul discharge, etc., because of the action of the germs of putrefaction, then it becomes your duty to remove these particles of placenta by dilating, if necessary, the neck of the uterus and scraping away the placental structures. This can often be done with the finger by pressing the uterus down from above, or in lieu of the finger it may be done by means of the dull curette. In such cases a careful curetting or separation and removal of the retained substances is demanded, because if you do not remove these structures they will furnish a medium for the further development of pathogenic and putrefactive bacteria that will continue to produce a toxine that may be absorbed and may so saturate the system that the patient loses her life. If the woman has had gonorrhœa before the abortion or labor, as many have, then we may have superadded to the poisonous toxine of putrefaction infection from the gonococci. So you will see, gentlemen, that the question of curetting the septic uterus ought to be carefully considered, ought to be studied just as you would study the indications for the performance of a laparotomy. If you will observe

the necessary aseptic precautions, and will select your cases properly, you will not only find that no bad results follow, but you will be gratified to find that most of your cases will be much improved and that many of them will be entirely cured. You cannot promise an entire cure in these cases, because no one knows what will result after any operative procedure. The vagina should be irrigated morning and night with a one to two thousand bichloride of mercury solution. After from two to four days we may remove the gauze, which can be done by introducing an aseptic finger into the vagina, catching the ends of the gauze, and pulling it away. Continue to irrigate the vagina twice daily for a while, then once daily, finally ceasing the irrigations altogether. These patients must not have sexual intercourse for a month or more after the operation, and they should not exert themselves in any injurious way. You will find the means I have outlined of great assistance in the operation of curetting, and by neglecting the precautions I have mentioned you will have bad results, and some of your patients will probably die.

THE TREATMENT OF SYPHILIS.

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WHATEVER view may be taken of the nature of syphilis, I think it is now generally admitted, although not proven, that it depends upon the introduction into the body of a micro-organism or germ which proliferates indefinitely and in some cases to an enormous extent. Besides the elaboration of a toxine, the multiplication of this germ induces localized cell accumulations with, in many cases, subsequent development of connective-tissue deposits, which interfere with the physiological functions of the economy and produce the various lesions called "syphilodermata," "gummata," etc. Histological investigation of these products of syphilis show them to consist essentially of young immature cells in the walls of the lymph-channels, in the parenchyma of the glands, and in and about the walls of the blood-vessels. These phenomena may be in response to the efforts of nature to prevent and to repair damage to the tissues ; but, as in many other of nature's efforts, when unaided by art, the results may be disastrous to the individual who is the subject of them. The object of treatment, as I understand it, is to prevent these cell accumulations, if possible ; to modify them, and to hasten their involution or absorption, without injuring or weakening the healthy or fixed structures. Although syphilis manifests itself in many varying forms, from the mildest to the most severe or so-called "malignant" form, the fact that many individuals have passed through the acute stages of the disease without any treatment whatever, and have never afterwards had any syphilitic evidences, warrants the belief that there is some quality in the blood and tissues which destroys the elements of infection and removes their pathological products. But whether or not we can rely upon this quality to combat the infection and eliminate its toxines, experience has taught us that art can aid in the removal of their pathogenic results.

From time immemorial, almost, one drug has been the potent agent employed against syphilis,—namely, mercury ; and, although in my opinion not an antidote, it certainly does have the most efficient action upon the symptoms of the disease. So far as my knowledge goes, nothing has been presented in later times to disprove the statements of Headland in regard to the action of mercury, and upon these may be based a scientific reason for the use of the remedy. Headland long ago showed that mercury, when properly administered, produces a fatty degeneration of tissue, especially of the unstable or plastic effusions which take place in various diseases, and that these fatty metamorphoses, being taken up by the lymphatics, are passed out of the body through the various emunctory organs.

But it is not enough to say that a man has syphilis and therefore he must take mercury. If we are to obtain the aid of the antidotal quality of the blood and of his tissues in general, he must be maintained at the highest possible level of health ; he must not indulge in any of the things which are known to cause degeneration of tissue ; in other words, his life must be a hygienic one through the whole course of his treatment. Although such a statement is in accord with experience, it is a general one, and may be modified according to the individual, for all syphilographers have met with patients—to be sure, robust, healthy, vigorous ones—who obstinately refused to follow the instructions of their medical advisers, who persisted in the use of alcohol and tobacco, even to an excessive degree, and yet were apparently able to resist the progress of so infectious a disease as syphilis. Generally speaking, however, a hygienic mode of life is essential as the first step in treatment. Indeed, the late Willard Parker, in his lectures, emphasized this opinion in his characteristic and vigorous way by saying to his class, “If the patient will exorcise the two devils of rum and tobacco, I will exorcise syphilis.”

If, on account of some idiosyncrasy of the patient, mercury cannot be given, other remedies which have a similar physiological action may be used ; but mercury is the best and most potent, and indeed may be said to be the specific remedy for this disease. At one time potassium iodide was considered equally valuable, but clinical observation and scientific research go to show that while mercury admittedly produces this fatty metamorphosis to which we have referred, iodine and its compounds merely stimulate the absorbents and hasten the elimination of the products set free by the action of mercury. Even in the later stages of syphilis, the so-called tertiary period, and even when we have reason to suppose that the earlier granulomata have been followed by

connective-tissue changes, mercury should be administered, but in combination with increasing doses of potassium iodide. The latter is, in my opinion, rarely indicated during the early stages of syphilis unless central or nerve lesions have occurred, or where a rapid elimination of the products of metabolism induced by the use of mercury is indicated. Then it should be administered only as an adjunct, and not as the principle remedy.

In some individuals, besides mercury, it may be necessary to use other measures which produce healthy tissue metamorphosis, such as hot baths, douches, massaging, special exercises, and periodical changes of climate. To the latter, aided by the hot baths, etc., I am inclined to attribute much of the rapid improvement which is obtained by patients who visit the various springs and other hydropathic resorts.

When we come to the question of the best *method* of treating syphilis, I am free to say that the method must depend upon the nature of each individual case. Although the foundation of the cure may be said to rest upon the fact that the patient is able to take and digest mercury, whether by the mouth or by inunction, by vaporization or hypodermically, much will depend upon the idiosyncrasy of the individual and the skill of the practitioner.

To define a little more clearly the methods of treatment, we will suppose that the patient presents himself with primary syphilis. That is to say, the first incubation period being ended, he has now what is commonly called the "initial lesion," which is characteristic, and in regard to which there can be no doubt. Its chronology, its color, its induration with the saucer-shaped loss of tissue, are all characteristic; and, associated with the inguinal glandular enlargements, leave no doubt as to the diagnosis. The individual has no particular suffering at this time, although he may be somewhat incommoded by the little mass on the sheath of the penis or in the tissues of the glands, and may be very much disturbed mentally at contemplating so serious a condition of things. What shall we do? How shall we treat this initial lesion, and shall we at once begin constitutional treatment?

As to the question of treatment of the local lesion, notwithstanding all that has been said and written against excision, I am inclined to practise the latter whenever the lesion is so situated as to make it feasible. Admitting that the disease is already constitutional when the initial lesion is first observed, experience warrants me in the statement that an infecting mass may be disposed of and the subsequent events of the disease may possibly be modified by early excision of the initial lesion. Whether we regard the primary adenopathy and the first

macule of syphilis as the result of toxines produced by the pathogenic germ, or as a growth of connective tissue induced by the multiplication of the germ itself, I think we may fairly and reasonably look upon the initial lesion as a depot or reservoir from which the infectious elements may be started in their process of multiplication. In some individuals the initial lesion is so situated that it cannot be excised without a degree of mutilation, which is unwarranted. On the other hand, domestic or social reasons may demand a speedy removal of the local lesion, which may be secured by excision and by securing primary union of the little wound.

Whether excision be practised or not, the involution process of the initial lesion may be hastened by local applications to it of mercurial preparations, and by the internal administration of the same remedy. This leads me to the question which has been discussed with more or less earnestness for some years,—namely, whether we shall wait until the end of the second incubation period before beginning constitutional treatment, or whether we shall commence at once,—i.e., as soon as the diagnosis of primary syphilis is determined. In my opinion, it is best to begin at once. Our objects, as stated in the earlier part of this paper, are, if possible, to prevent the disease from becoming severe, to interfere with the multiplication of the microbic bodies upon which it depends, and to maintain the tissues in as healthy and resisting a condition as we can. Our object is not to make a diagnosis and then wait for confirmatory proof, but to heal the individual who is diseased, who is infectious, and in whose body circulates a material which feeds and multiplies upon the tissues of that body. Why wait, if we have a means,—call it what you please,—an “antidote,” or a “germicide,” or an “alterative,” or what not; but if it is a means which has undoubted and admitted power, why not employ it at once from the very moment we are certain that the individual has a disease it is our duty to combat?

Even in the most recent and authoritative utterance upon this subject, the author,¹ after spending considerable time in an attack upon those who believe in beginning the treatment of syphilis before secondary manifestations appear, contradicts himself by giving nine different reasons for the treatment of the *initial lesion* by the specific action of mercury. If it be admitted, as it seems to be by the majority of syphilographers, that histologically all of the secondary manifestations of syphilis are found to be composed of the same cell accumulation,

¹ Venereal Diseases, by Robert W. Taylor, M.D., page 820.

with perhaps the development of a few connective-tissue fibres, as compose the initial lesion itself, why should it be argued that there is "nothing to treat until generalization has manifested itself." Again, if specific treatment of the initial lesion be warranted in the particular cases to which the author refers, why is it not warranted—and, indeed, required—in all cases? We do not know exactly what the microbic body upon which syphilis depends does, but we do see certain manifestations which we have named papules, *et cætera*, and we find that these, when subjected to our present known means of examination, are composed of essentially the same pathologico-anatomical elements. We know that these seem to be the same exactly as those which appear at the original point of entry, which we denominate the initial lesion. Why then, if specific treatment be good for the local lesion, abstain from the administration of that remedy which we know hastens the involution of those manifestations which belong to the so-called generalized or secondary stage? In my opinion, the effects of syphilis are due not only to the mechanical interference with the function of the part or parts where these local accumulations take place, but also to a systematic poisoning, due to the elaboration and circulation of a toxine produced by the microbic body itself. If the vital forces of the individual be maintained at what might be termed a par of health, and all his functions kept at the highest point of activity, his economy is better able to take care of the toxines, while by the judicious administration of mercury, his body is enabled to dispose of the granulomata or cell accumulations in their varying grades of intensity. This implies constant watchfulness, the exercise of careful discriminating judgment, and in some cases ingenuity on the part of the doctor; and, on the part of the patient, of obedience, confidence, and patience.

We know that the intensity of the disease depends largely upon the vulnerability of the individual himself, and we also know that by the too vigorous administration of mercury the healthy tissues of that individual are rendered less resistant to the inroads of syphilis. Thus may be substituted or added the toxic effects of the drug to the toxic effects of a disease which, if left to itself, will in many cases, at least, pursue a certain chronological order, and, so to speak, finally wear itself out. Hence the object in view is to administer this potent remedy only for the purpose of *assisting* the economy to counteract the effects of the infectious principle and the toxines which it generates. Whether the observations of Semmola and of Justus upon the changes of the blood in syphilis can be made practicable or not I am not prepared to say, but if the diminution of hæmaglobin and red corpuscles

which takes place in syphilis can be modified by the administration of mercury, as they have shown, it would seem that such examinations would serve as an accurate guide to the administration of the drug.

The criteria at present for the administration of mercury are to be found in the disappearance of the pathological accumulations, of the lesions which we can see and feel,—viz., the glandular enlargements, syphilodermata, *et cætera*,—and in the maintenance of the individual's general well-being. Now, if we can add to these a laboratory criterion, we have a stronger foundation upon which to base the administration of the remedy.

As to methods of *administration*; if the remedy is well borne when taken by the mouth, this is the preferable mode. Only so much should be administered daily as can be digested easily and freely without interfering with stomach and intestinal digestion, and only up to the point of the drug's physiological action. In the majority of cases an habituation to the remedy ensues, and therefore I am accustomed to make intermissions in the treatment from time to time, always, however, maintaining the hygienic and dietetic *status quo* of the person. It should be observed that many persons do not bear the internal administration of mercury up to the point that may be necessary to act vigorously upon their lesions. In such cases the method of inunction should be resorted to at once. This is less depressing than the vaporization method, is not at all painful, and, in spite of the staining of the skin, is less disagreeable than the hypodermic method, and is often brilliant in its results.

It is my custom, during the course of the treatment of syphilis, to intermit the internal administration of the drug, even if it is well borne by the stomach, and substitute inunctions, always keeping in view the general principles upon which the drug is administered.

In certain malignant forms of the disease, where the tissues of the individual seem to be rapidly breaking down, hypodermic injections of the bichloride may be given with very prompt effect. They should be repeated with care, bearing in mind the fact that death has ensued from this method of using the drug. With ordinary precautions, however, and choosing the buttocks for the site of the injections, there is, in my opinion, but little danger. It certainly is a very rapid and effective method of getting the system of the individual under the influence of the drug, but the injections should not be repeated too often. For example, I have seen a gentleman suffering from a very mild attack of syphilis almost exsanguinated by receiving an injection of the bichloride every other day up to the number of fifty.

Even in cases of malignant syphilis the effect of the injections should be watched very closely, and every possible accessory measure taken to increase the general well-being of the patient.

One of the most important guides to indicate the period during which treatment should be carried on is the condition of the glands throughout the body; particularly the epitrochlear and those which are not usually found enlarged in the more common dyscrasia. So long as these glands remain enlarged, it is one indication, at least, that treatment should not be discontinued. Enlargement of the glands alone is not positive evidence of syphilis; but if the practitioner has followed his patient from the onset of the disease, and has appreciated that these enlargements have grown smaller or disappeared entirely under treatment, it is confirmatory evidence that they are syphilitic in their nature. If the individual gives a suspicious history and has glandular enlargements, it is well to give him the benefit of the doubt and administer mercury; but, at the end of three months,—say, if no material change has taken place in the size of the glands,—it may be reasonably concluded that connective-tissue changes have occurred in them to such a degree that they are now permanently enlarged.

The duration of the treatment, irrespective of the state of the glandular system, will depend somewhat upon the individual and the continued activity of his disease. But experience teaches that long continued and gentle treatment for *at least* two years (some authorities say five, and one has lately urged seven) affords the patient protection from the effects of the disease later in life.

THE TREATMENT OF INJURIES OF THE ELBOW-JOINT.

BY JOSEPH P. TUNIS, A.B., M.D.,

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BEFORE any treatment is undertaken for an injury to the elbow-joint, the diagnosis between a sprain, a fracture, and a dislocation should be established. Sometimes this becomes a difficult matter either on account of the swelling attending the injury or on account of the nervousness of the patient. In such cases, rather than have any doubt about the diagnosis, it is best to administer ether and decide the point once and for all. In deciding between a fracture and a dislocation when the deformity is not very pronounced, the relative position of the three bony landmarks—*i.e.*, the olecranon and the outer and inner condyle of the humerus—becomes of great importance. If these bony prominences are *not* on a line the case is certainly a dislocation ; if they are in their natural relation to each other and yet dislocated *en masse*, the case is a fracture. As a rule the diagnosis is easily established. When in doubt it is well to treat the case as if it were a fracture. It is also well to remember that *crepitus*, which is such an important physical sign, is frequently absent when the line of fracture involves the articular surface, and thus allows the synovial fluid to pass between the fragments. On the other hand, there is a form of “joint crepitus” which is present under certain conditions in any joint, more especially the shoulder, and is easily elicited after a chronic synovitis.

By far the most common injury met with at the elbow is a sprain. Evaporating lotions, such as lead-water and laudanum, either in full strength or diluted with equal parts of alcohol, may be employed. Their effect is soothing and they are useful as long as they are kept moist. When dry they only irritate the skin. Oiled silk or waxed paper will be found useful in keeping the dressings moist, as well as

adding to the patient's comfort by reducing the number of dressings which are necessary. Much more important than any local application in these cases is the proper use of a well-padded splint. For an ordinary sprain an internal angular splint should be applied for at least a week. If the capsular or the lateral ligaments are also torn the case will require a greater length of time to recover. In all dislocations the laceration of one or more of these ligaments must occur. In all severe sprains at the elbow there is more or less of an effusion into the joint, and complete rest is the best means of promoting its absorption. While laceration of the capsular or lateral ligaments of the elbow-joint is rarely associated with a simple sprain, such a complication may occur, and thus lengthen the course of treatment from one to three weeks or even more.

Passive motion should be resorted to at the end of a week, and the part thoroughly swabbed with alcohol or soap liniment. The application of such remedies accomplishes two purposes ; not only does it aid in keeping the skin in a normal condition and prevent any excoriation of the parts, but at the same time it enables the surgeon to move the parts gently without the patient offering any resistance to such manipulations. At the end of ten days, if there is no swelling, no dislocation, and little or no pain on extension and flexion, the splint can be removed and the patient allowed to carry his arm in a bandage sling sustaining the wrist alone, a primary roller bandage having been applied from the finger-tips up to the seat of injury.

Injuries which have at first been carelessly diagnosed as sprains will frequently show unmistakable signs of fracture when carefully examined two or three weeks later. Limitation of motion from the presence of callus is pathognomonic of the latter injury.

FRACTURES AT THE ELBOW-JOINT.

The fractures which are most commonly met with occur in either one or other of the condyles of the humerus, frequently associated with a dislocation of the forearm either forward or backward. As the internal condyle is the larger of the two, it is more liable to fracture than the external. A "T" fracture or a splitting of the humerus between the two condyles, together with the detachment of one or other of these bony prominences, is sometimes met with. While any fracture at this joint is liable to cause considerable limitation of motion subsequently, it is safe to assume that the easier the diagnosis, or in other words, the greater the extent of the fracture, the greater will this amount of limitation be. It is not, however, always those cases which

seem the most extensive that cause the greatest loss of motion. This is well illustrated in one of the cases which follow,—namely, Case I., where an apparently insignificant fracture, the existence of which was doubted by some of the doctors who examined the case, led to almost complete ankylosis at the joint.

The diagnosis of fracture should not be a difficult one, and abnormal mobility of the part is more to be relied upon than the presence of crepitus, the latter sign being frequently absent or masked by the presence of synovial fluid between the fragments in certain cases. It is a good rule to regard every case of dislocation of the elbow as a probable fracture and to treat it as such, while every patient with a dislocation or a fracture, one or both, should be informed before the treatment is instituted that more or less limitation of motion is almost certain to result, and that the patient must not expect to have his arm in as good condition subsequent to the injury as it was before.

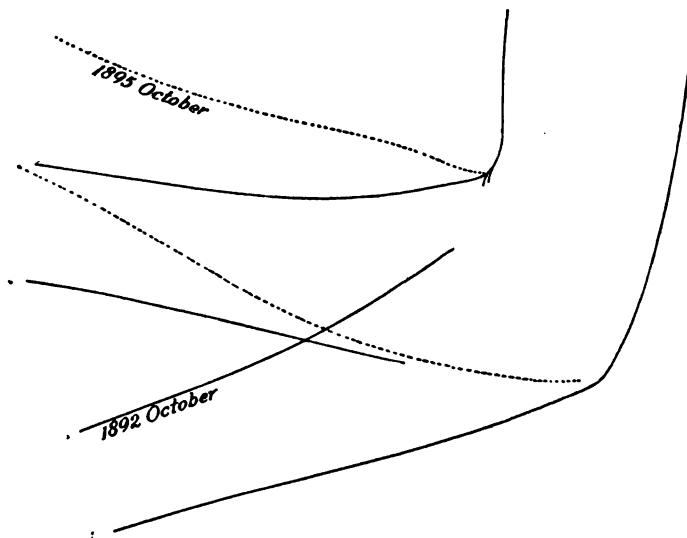
To illustrate the methods and the effects of treatment the histories of the following cases are in order :

CASE I.—Marshall S., aged twelve years, came to the Episcopal Hospital on the 14th of June, 1890, with a backward dislocation of the left elbow which it was impossible to reduce without ether. As soon as the anæsthetic was administered, however, the bones were readily reduced, and the freedom with which they slipped in and out of place again as well as the great mobility of the external condyle of the humerus made the diagnosis of fracture of that bone more than probable. The boy's father accompanied him to the hospital, and was told after the case was dressed that the left elbow would certainly be stiff. The treatment of this case extended over many weeks. He was at first put upon an internal angular splint. This was replaced about two weeks after the receipt of the injury by an anterior angular splint. Nine weeks after the accident an anterior angular splint fitted with a Stromyer screw was resorted to without any apparent benefit. Forceful movements were then employed with great pain to the patient two or three times a week persistently for several weeks, without any benefit as far as the increase of motion was concerned. Carefully regulated exercise was finally employed, and all other treatment abandoned in the hope that nature would in the course of time bring about a sufficient absorption of the exuberant callus to permit some motion at the joint.

More than two years after the receipt of the injury I again saw this patient. There was then a well-marked lump of callus over the external condyle at the site of fracture. Motion at the joint had

increased considerably, and it was possible to move the arm through an angle of several degrees. When last seen at the hospital there was practically no motion at all at the elbow. Reference to Fig. 1 will show the extent of the motion which was possible two years after the injury (October 4, 1892).

FIG. 1.



Diagrammatic outlines of Marshall's forearm and upper arm two and five years after a fracture and dislocation. The increase of motion, as shown by the dotted lines, is considerable, owing to the absorption of callus.

Three years later, and five years after the receipt of the injury, this patient again came to my office with a very much more useful arm. The increase of motion at the elbow was considerable, as can be seen by reference to Fig. 1. The patient can tie his cravat in a sailor knot, but is unable to tie it in a bow. There is a large lump of callus at the site of fracture and decided thickening just above the elbow, which makes the circumference of the arm just above the joint one-half an inch greater on the left side than it is on the right. On motion there is a slight gritting to be felt over the injured elbow. The patient belongs to a military organization, and is sometimes reminded of his injury by the drill-master trying to straighten his left arm when he stands at attention. This case illustrates especially the effect of time on the absorption of callus.

CASE II.—Annie S., aged eleven years, the sister of Case I., fell in the summer of 1895 and dislocated her left elbow, at the same time

fracturing the internal condyle of the humerus. The case was treated promptly by a doctor who lived in the neighborhood of the country town where she was stopping, but there is at present evident dislocation of the head of the radius and anterior dislocation of the humerus. There has been considerable improvement in the amount of motion possible at the joint in the last three months. The patient complains now simply of weakness.

I did not see this case until some two months after the injury, when all treatment had been discontinued, and I was consulted simply in regard to the propriety of surgical interference. If the arm is a useful one, and the motion of the joint is not seriously interfered with, an operation should not be thought of.

If we were able to look beneath the capsular ligament in Case I. we would unquestionably see an enormous mass of callus which is still present in the joint, the presence of which has interfered so materially with the normal movements. The gradual absorption of this callus has led in the last two years to considerable improvement in the usefulness of the arm, and the case illustrates very well the fact that nature, if left to herself, will do a great deal more for these cases than forcible movements can possibly hope to accomplish. In surgical practice it is a matter of frequent observation to find that masses of callus which at first interfered considerably with the motions of a joint or caused disfiguring deformity of bones superficially placed in the arm or leg have improved very much as time went on.

The propriety of an excision of the elbow-joint of Case I. was discussed about a year after the receipt of the injury, but the idea was abandoned and nature allowed to take its course.

CASE III.—Marie M., aged six years, fell and fractured the internal condyle of her humerus more than a year ago. The case was treated for two weeks on an internal angular splint, then for a week on the anterior angular splint, and for a week with a plaster-of-Paris bandage. The case was uncomplicated, and yielded promptly to treatment. In the course of five weeks all the bandages were removed, and the child simply carried her arm in a sling for another week. To-day this patient serves as an illustration of a certain class of such injuries in which the results are perfect. This little girl has complete motion at the elbow-joint, and it is impossible now to see any indications of the injury which she has sustained. Extension and flexion are absolutely normal. When the results of an elbow-injury are as satisfactory as this it is fair to suppose that the diagnosis was faulty, and that the injury at first was not really a fracture. In this case,

however, the signs of fracture were unmistakable, abnormal mobility of the fragment, interference with extension and flexion, and, above all, crepitus being present.

FRACTURE OF THE OLECRANON.

CASE IV.—Michael S., aged forty-five years, presented himself at the Presbyterian Hospital dispensary with characteristic signs of fracture of the olecranon. The fragment was drawn well up above the elbow some three or four inches by the contraction of the triceps muscle, and there was decided dimpling of the skin over that fragment. This was not the first time he had sustained this injury, and he claimed that the bone had been broken on three separate occasions.

Fractures of the olecranon occur with no very great frequency, and the injury when present should give rise to no trouble in the diagnosis. The deformity is so decided, usually, that the patient himself calls the physician's attention to the bone "out of place." Absolute immobility in the extended position is the most rational treatment for the first four or six weeks. If it is impossible to bring the fragments into apposition during that time by every available means, such as strapping the upper fragment and pulling it into position, extreme extension, etc., the question of wiring should be considered. I have at present two cases of this injury under treatment. The first one (Case IV.) makes it a business to keep the upper fragment as far away from its normal position as possible, and he goes around from hospital to hospital, generally in a state of intoxication, making the most of his injury.

He has been treated by placing the arm in extreme extension, and, after the application of a resin-plaster strap to the upper fragment, pulling it in place by that means, by a primary roller of flannel and then a plaster-of-Paris bandage.

CASE V.—Patrick B., aged twenty-three years, came to the dispensary of the Presbyterian Hospital some four months ago with a fracture of the olecranon. The fragment was a small one, and by the action of the triceps muscle was not carried more than an inch above the elbow-joint. The application of a plaster-of-Paris bandage in the extended position served to bring the fragments into thorough apposition. Union occurred at the end of three weeks, and in five weeks the position of the arm was changed and extreme extension no longer continued. At the end of six weeks the bandages were removed and he was allowed to carry his arm in a sling. He had not long enjoyed this privilege, however, before he again fell and refractured the arm

in the same place. Two weeks after this refracture occurred, his arm having been kept in the extended position with a plaster-of-Paris bandage, on removing the plaster splint it was found that the bones were not in exact apposition, and that a space existed between the shaft of the ulna and the fragment of the olecranon of at least half an inch. It is doubtful whether either of these cases will recover without an operation. Certainly in the first case (Case IV.) it will be necessary to wire the fragments before satisfactory union can occur.

[NOTE.—Case IV. did not remain long under treatment, and has since been lost sight of.

It is now five months since Case V. came under observation. He has a useful arm now, three months after the receipt of the second fracture of his olecranon. There is distinct fibrous union between the fragments and a separation of only half an inch.]

DISLOCATIONS OF THE ELBOW-JOINT.

The treatment of these injuries is practically the same as it would be for a fracture, as in most cases every dislocation is accompanied by a fracture. In these injuries the ligaments are always more or less lacerated, depending on the severity of the injury. After the parts are restored to their normal position, absolute rest on a well-padded anterior right-angled splint for ten days, and then on an internal angular splint of the same angle for another ten days, will be sufficient to establish a recovery in most cases. Passive motion should be commenced at the end of ten days in a dislocation, and at the end of two weeks in a fracture. In the reduction of dislocations of the elbow the administration of ether not only renders the procedure much easier both for the patient and the surgeon, but it also enables the latter to decide positively whether or not a fracture is present. In the majority of cases, therefore, it is best to give an anaesthetic.

Medicine.

A CASE OF PERFORATING GASTRIC ULCER TREATED SURGICALLY.

CLINICAL LECTURE DELIVERED AT THE ABERDEEN ROYAL INFIRMARY.

BY DAVID W. FINLAY, B.A., M.D., F.R.C.P.,

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GENTLEMEN,—It is now a good many years since the view began to be put forward that perforation of the intestine occurring in the course of enteric fever might reasonably be treated by abdominal section, excision of the ulcer, and stitching of the resulting hole in the bowel. Upon the same lines it occurred to me that this mode of treatment might be applied to the case of perforating ulcer of the stomach with still stronger reason, because here we should be dealing with a case which had not been pulled down by the continuance for a longer or shorter period of a febrile temperature and the other unfavorable conditions accompanying or resulting from the febrile condition. And in an address which I gave at the opening of the session of the Middlesex Hospital Medical School in October, 1884, in commenting upon recent advances both in the prevention and treatment of disease, and the hope which these held out for the future, I expressed myself in the following terms: “Who can doubt that, if we could always come to an accurate diagnosis in the early stage of acute intestinal obstruction, which I may surely designate the opprobrium of medicine and surgery, the results of our treatment would often be more satisfactory? And is it too much to hope that, with early diagnosis and immediate abdominal section, the lives of some of those who now perish from perforations of the stomach or intestines might be saved?”

I was not then aware that such a course of treatment had been recommended by any other physician or surgeon, but I have learned

since that a year previously the same view had been suggested by Mr. N. C. Dobson, of Bristol, and two years before that by the distinguished American surgeon, Marion Sims.

I have accordingly been on the lookout since the time I have mentioned for a case of perforating ulcer of the stomach, and the case which I am now about to relate is the first which I have met with. And the theoretical views which I was led to adopt in the first instance have been abundantly justified within the last two or three years by the success which has attended the surgical treatment of such cases in a considerable number of instances.

A few minutes before seven o'clock on the evening of the 29th of May, 1895, I received a communication by telephone from my house physician in this institution, intimating the admission at 6.40 of a young woman, aged twenty-four, a shop-girl, presenting symptoms which suggested to me the probability of a perforating ulcer of the stomach. In order to save time in case my surmise should turn out to be correct, I called on Professor Ogston on my way down to the infirmary, and at my request he was good enough to accompany me to see the case, which we found had been admitted, as above noted, with the following history: she had suffered for a long time from anaemia, and more recently from pain after food, with flatulence. The pain was relieved by vomiting, which, however, was infrequent. In the January before admission she had had an attack of haematemesis. Three days before admission she had been seized with abdominal pain and distension, without vomiting, but had been able to keep on with her work. On the morning of the day of admission, about nine o'clock, after drinking a bottle of lemonade, she was attacked by severe abdominal pains, with vomiting. In addition to the pain, she suffered severely from thirst, for which she had been drinking cold water freely, and she had had stimulants, which her stomach did not retain. In the afternoon the pain became worse, the abdomen became more distended, and she was sent to the infirmary.

On admission she complained of great pain in the abdomen, but was not collapsed. She was very pale and anaemic; her pulse was 120 per minute, of fair strength and regular; respiration, 36 and thoracic; temperature, 100.2° F. The tongue was moist and clean; the abdomen tense and distended, the distention being especially marked below the umbilicus. It was tender all over on pressure, but especially so in the left epigastric region, and did not move with the effort of respiration. The percussion resonance was markedly tympanitic all over the front, the liver dulness being obliterated and the tympanitic note rising as

high as the third rib on the right side ; there was some dulness in the flanks. The physical signs, together with the previous history and mode of onset of the attack, left no room for doubt as to the diagnosis, and, with the consent of the patient, immediate preparations for an abdominal section were made, and she was operated on by Professor Ogston between eight and nine o'clock.

On opening the peritoneum between the xiphoid cartilage and the umbilicus by an incision five inches long from just below the xiphoid cartilage to within one inch of the umbilicus, a quantity of gas escaped, together with much watery fluid of an opalescent grayish appearance containing some lymph-like flakes and particles of food ; more fluid was mopped out with sponges. The stomach was then drawn forward, and on the anterior wall and lesser curvature, about three inches from the pylorus, there was found a perforation from one-quarter to one-half of an inch in diameter, round which there was a quantity of fibrinous lymph deposited. The stomach having been emptied and washed out through the perforation, which had been enlarged slightly to admit the little finger for examination, the edges of the ulcer were cauterized, and the perforation closed by a continuous (silk) Czerny-Lembert suture. The peritoneal cavity was then thoroughly flushed out with warm boiled water until the water ran out clear, and the wound was closed (a drainage-tube being left in its lower part), and dressed in the usual way. The patient took the anæsthetic well, having a fairly good pulse of 120 at the end of the operation (which lasted one hour and twenty minutes), although she was troubled with slight hiccup. Morphine to the extent of a quarter of a grain was twice administered subcutaneously up to midnight, and she passed a fair night, soon losing the hiccup and not being troubled with sickness.

For particulars of the progress of the case subsequent to the operation I am indebted to Professor Ogston, to whose wards the patient was transferred. I may summarize these by stating that for the first three days she had occasional attacks of vomiting, as well as some abdominal distention and pain, but otherwise her condition was favorable. On June 3 it was noticed that her general state was improved, the bowels were acting satisfactorily, her tongue was coated but moist, and that she slept well and began to be hungry. The sickness, abdominal pain, and tenderness had ceased, and a slight cough which was present before admission was less troublesome.

Up to this time she had been fed chiefly by nutrient enemata, but these were now diminished and more nourishment given by the mouth.

On June 4 it was noted that there was a slight fulness in the left inguinal region which was tender to the touch. By the 6th this was more distinct, and her tongue was more furred, brown, and dry. The cough still gave her some trouble. For some days after this matters went on without much change either for the better or the worse; but on June 15 she complained of pain at the site of the fulness above noted as well as in the right inguinal region, and fluctuation was made out in both situations.

She began again to be troubled with vomiting and had diarrhoea, her urine at the same time showing from $\frac{1}{20}$ to $\frac{1}{16}$ of albumen. On this day her abdomen was again opened below the umbilicus, and several ounces of very fetid pus were evacuated, an India-rubber drainage-tube being afterwards inserted.

Next morning she was rather better, with tongue moister and pulse firmer but rapid (120): the temperature ranged between 100.6° and 101.4° F. The improvement, however, was only temporary, and from this point she became steadily weaker, diarrhoea was troublesome, and she had attacks of coughing at intervals. Pus continued to be discharged freely from the lower wound, mingled ultimately with particles of faecal matter indicating a perforation of the bowel. Vomiting recurred, becoming excessive during the night of the 17th and 18th of June, and she gradually sank and died on the evening of the latter day, having survived the original operation for twenty days.

At the post-mortem examination the whole surface of the peritoneum was found coated with recent lymph becoming purulent, and the cavity contained twenty-six ounces of pus. The ulcer on account of which the operation had been undertaken was on the anterior surface of the stomach and lesser curvature, about midway between the cardiac end and the pylorus. Its edges were closely approximated, but the stitches had apparently given way, being probably torn out in removal, owing to softening of the tissues. The surface of the stomach in the neighborhood of the ulcer was closely adherent to the under surface of the left lobe of the liver, thus completely closing the perforation. In addition to this ulcer there were two others, of about the size of a threepenny and sixpenny piece respectively, on the posterior wall of the stomach and nearer the pylorus. These, however, had not penetrated deeply into the tissue of the organ. In the ileum, near the lower of the two openings in the abdominal wall, there was a small perforation from which faecal matter escaped; and under the right lobe of the liver there was a pocket containing about six ounces of thick pus. The liver itself was firmly adherent to the diaphragm.

In commenting upon the case just narrated there are several points of interest which invite remark. The result, unfortunately, was not what we hoped for, and this was all the more disappointing, as it seemed for some time that a completely satisfactory recovery was not improbable.

A good many successful cases have been recorded within the last two or three years. Five such were referred to by Mr. Pearce Gould in his address on the Operative Treatment of Perforative Ulcers of the Stomach and Intestines at the annual meeting of the British Medical Association at Bristol in 1894, as having been reported up to that time; and since then I have met with several more in current literature,—namely, one reported in the *British American Journal* of July 6, 1895, occurring in University College Hospital, London, and two in the last volume of the Transactions of the Clinical Society of London (vol. xxviii., 1895), one of which was treated in Guy's Hospital and the other in St. Mary's.¹

As regards the present case, looking to the history and to the appearance presented on the under surface of the liver with which the ulcer of the stomach had been in contact, it seems not improbable that the attack of pain which took place three days before admission was due to localized peritonitis set up by the near approach of the ulcer to the surface, and which under more favorable circumstances might have resulted in adhesions strong enough to have prevented perforation into the general cavity of the peritoneum. The perforation itself seems to have been determined at least in part by the lemonade which the patient drank; bearing out the general experience that perforation in such cases generally, if not invariably, takes place when the stomach is full or nearly so, and it would be all the more likely to occur when so much fluid of an effervescent kind had been introduced into the stomach.

As to the signs enabling an absolute diagnosis to be made, I would especially point to the obliteration of the liver dulness as being of great value. It must be noted, however, that it is not always present, and in some of the recorded cases it is not stated whether it was present or not, and that its presence is not limited to cases of perforation where the stomach is the organ perforated, but may occur in connection with perforations elsewhere in the alimentary tract. The history of the case and the other surroundings must, of course, guide us here.

¹ Reports of other cases will also be found in the *Lancet*, of March 2, 1895, and June 20, 1896.

The surgical points of the case do not lie within my province, and I need say almost nothing on this head, except that the steps of the operation seemed to me admirably adapted to the end in view. The result shows that the object of the operative procedure is to secure the absolute cleansing of the peritoneum, and that even with the greatest care and thoroughness, there may remain some recess not reached by the flushing out, in which septic material remains to act as a focus for the establishment of general peritonitis.

It would be a waste of time to discuss at length whether operative treatment in these cases is justifiable or proper. We have only to think of the history of ovariotomy and of the surgical treatment of perforation of the vermiform appendix (not to speak of the successful cases above cited) to come to a judgment on this point. The latter condition is one which is strictly analogous to the perforation of the stomach ; and after surgeons have accumulated a similar body of experience with the newer operation, there is little doubt that the results will improve equally. It is not, of course, implied that all cases of perforated gastric ulcer should be forthwith subjected to operation. Cases must be discriminated, and it would be generally inadvisable to operate when the patient is in a state of collapse. But given a patient who has rallied from collapse following the occurrence of perforation, and in whose condition otherwise there is no special contraindication, it would be positively culpable to withhold the chance of restoration which the timely application of surgical methods holds out.

ANÆMIA IN CHILDREN.

CLINICAL LECTURE DELIVERED AT THE GOOD SAMARITAN HOSPITAL,
CINCINNATI, OHIO.

BY F. FORCHHEIMER, M.D.,

Professor of the Diseases of Children in the Medical Department of the
University of Cincinnati, Ohio.

GENTLEMEN,—This little girl, who was three years old on the 18th of July, complains of bowel trouble, and does not care to walk. When she walks a little distance, we are told that she leans up against a chair and does not care to go any farther. “She seems to have bearing down pains,” the father remarks, although she is so young.

The child has had diarrhoea all summer. Inquiry into her previous history shows that last winter she was perfectly well with the exception of a cold; before that she had trouble in dentition. First it has been the teeth, then catching cold, then the teeth again, and then a cold, and the truth is, she has had diarrhoea nearly all the time. The stools were greenish, two or three a day, while often at night they were whitish, light yellow, or greenish. Sometimes they occur as frequently as five or six in a day. They are caused by improper feeding. I do not hesitate to say this even without inquiring into the subject, because this is the cause in the great majority of cases. The mother now tells us that the child has not been nursed since she was three months old; since that time she has had milk, crackers, candy, molasses, meat, raisins, or anything she chose to eat.

The next symptom is the difficulty in walking, and this difficulty will be explained by further examination. This is an only child, and its family history is distinctly tubercular; while three of her uncles and aunts and both grandparents died of tuberculosis, what can we expect in a case like this? The first thing that strikes you in looking at the child is that it is anæmic, but it would be better to say simply that the child is pale. You are not justified in saying that the child is anæmic simply because it is pale; there are a great many other

causes of paleness besides anæmia, and when we come to examine the blood, we may find that the child is not anæmic. The child has extreme pallor, and we can observe this best by looking at the finger-nails, the ears, and the mucous membranes, to which I wish to direct particular attention. You can see here a typical anaemia of the ear, and if you will look at each other's ears, you will notice that they vary in color from a red to a beautiful pink, while this ear is absolutely waxen, relieved only by the outlines of one or two large veins. If you look at the finger-nails you find that they are very pale, the same is true in a measure of the conjunctiva, but it is by no means as pale as the color of the ear would indicate ; in addition, the mucous membrane of the mouth is pale and now we say that the child is anæmic, and we prove it by finding the percentage of hæmoglobin somewhat reduced. We have had the blood examined before bringing her before you, and have found that the percentage of hæmoglobin is fifty-five, and the number of red corpuscles in a cubic millimetre 3,600,000. The white were apparently normal, but were not estimated because the specimen was accidentally destroyed before the estimate was made. Fifty-five per cent. is abnormal, as sixty per cent. is the normal at this age, for you will sometimes find in perfectly healthy children that the hæmoglobin does not exceed sixty per cent. ; the percentage varies from sixty to one hundred and ten, due, probably, to the fact that the examination is made during different stages of digestion, you therefore cannot count anything abnormal in a child under five years of age which is not under sixty per cent. The normal number of red corpuscles in a cubic millimetre is from 3,500,000 to 4,000,000. You should not therefore hesitate in saying, from the blood-circulation, that the child is suffering from chlorosis, or better, that she is suffering from oligochromæmia. To those who looked upon oligochromæmia as characteristic of chlorosis, this child is suffering from chlorosis. I do not consider the two conditions as identical, for we find oligochromæmia in all forms of anæmia in children except the pernicious form, and certain others due, especially, to the acute exanthemata.

There is no lymphatic enlargement seen in the neck, which is remarkable in a child in this condition, nor is there enlargement of the lymphatics in the groin.

We should expect to find the liver and spleen enlarged in this case. Both are slightly so, the liver more than the spleen. Why do we expect to have this enlargement ? There is no trouble in the chest, no disease of the lungs, but this child has a chronic intestinal catarrh, and as a result there is fermentation in the intestine. In consequence,

certain abnormal bodies are formed in the intestine, these are taken up by the portal vein and carried to the liver, which must be supplied with an increased quantity of blood in order to destroy these abnormal products, and, as a result, we have an enlargement of the liver. Secondarily, there is a similar increased supply of blood to the spleen which causes enlargement. This symptom is not sufficiently marked to permit us to classify this as a case of anæmia in which an enlargement of the spleen is a characteristic feature of the disease.

The inability of the child to walk would not suggest paralysis, but is due to weakness, which is caused by a diminished supply of nutrition to the nerve centres, dependent upon the absence of haemoglobin. The mother tells us that the child is good-natured except at the table, where she is cross and throws things away, and does not care to eat. She is very restless at night, one of the most common symptoms of anæmia in children; peevishness during the day is also a symptom of anæmia, though this poor child has been sick so long that probably the mother does not notice her peevishness. The appetite is very irregular, just as in chlorotic girls; she will either eat not at all or else she wants meat, gravy, etc. She sweats very much at night, both winter and summer; this is another common symptom of anæmia, and is due to the effort of the sweat-glands to eliminate something that is circulating in the blood. Sometimes you will find this symptom so pronounced that it will lead you to your diagnosis. It is frequently seen in patients convalescing from typhoid fever, they are also extremely anæmic. In one case that came under my observation, sweating had been going on for a year, it was due entirely to anæmia, and the removal of the cause put a stop to the sweating. In another case, which I saw afterwards,—having been made wiser by the first case,—I set to work at once to examine the blood, and I found anæmia. I have no doubt that much of the sweating in rickets is due to the same cause. A convalescent from typhoid fever that was under my care (a child) had a beautiful, heavy head of hair; the sweating was so profuse that the hair became so wet that the moisture ran through and saturated the pillow. After the hair began to fall out, although it had been cut off, the pillow continued to be saturated.

The mother of our patient tells us further that the child twitches during the night, and sometimes during the day. This is another symptom of anæmia, and from this we can readily understand the production of chorea. There is another symptom about which I talked to you in connection with the neuroses of children; the child still wears diapers because she wets herself.

I want to talk to you about the etiology of this case and about the etiology of anæmia. It is perfectly clear that there can be but one cause for the anæmia in this case, and that it is chronic intestinal catarrh. What has produced this chronic intestinal catarrh? I am told that it is improper diet. What I want to call your attention to especially is the relation of intestinal catarrh to this condition. I have in another place made the statement that the principal source of haemoglobin is the intestinal tract. If this is correct, a person suffering from anæmia, who has had intestinal catarrh, must be suffering from a reduction of haemoglobin. I dare say that if we examine the blood of this patient at different times during the day, we should find that Dr. Southgate has gotten the maximum estimate of the haemoglobin and not the average. Make it a rule to examine the blood two hours after meals, that is the time to get the highest percentage of haemoglobin, and it was at that time the blood of this child was examined. There is no doubt that this patient proves, as many others have proved, the correctness of the assumption that something is going on in the intestinal canal which prevents her from using the haemoglobin factors that are given to her in the food, and the object of all therapy must be to help the intestine to assimilate these substances.

Our patient is then suffering from a secondary anæmia, not an idiopathic anæmia, but an anæmia which is due to a faulty haemopoiesis, not an anæmia due to haemolysis. The principal factor in the treatment of this child is proper feeding, because without this we will accomplish nothing. Outside of a children's hospital this will be exceedingly difficult to accomplish in this case.

I want you to bear in mind, in addition to what we have said, that there is an entire absence of all evidence of tuberculosis, a very rare occurrence in such cases. It is very rarely that you find a child with these symptoms of deranged digestion without any evidence of tuberculosis. "Give the child plenty of good food;" you find your textbooks say this in the most off-hand manner, "good food," "nutritious food," etc. What is good food? It is a kind in which fermentative action will not go on in the stomach and small intestines. There are a great number of the lower forms of life which produce these kinds of change, always found in the air and in the food. If we can get into this child's alimentary canal a comparatively sterile air, for air is constantly introduced into the stomach in the act of swallowing, and if we can get into the stomach a comparatively sterile food, we will accomplish our purpose. We will order for this child plenty of fresh air, keep her out in the open air, take her on the hills if possible; besides,

we must teach the mother how to prepare the milk properly ; she must not buy it at the grocery or of the ordinary milk-man, she must obtain good milk. You will be surprised how children will pick up under this treatment, without any drugs. You will be surprised to see how this child will pick up under comparative sterilization of the alimentary tract and good food ; inside of one week the hæmoglobin will increase markedly ; the size of the liver will be reduced in a comparatively short time, because the abnormal bodies are no longer produced in the intestinal canal and carried to the liver, there to produce hyperæmia, for this process has not gone on to any connective-tissue formation. In one week this child will be brought into such a condition that we will see none of the irritant effects now present. And here is another important thing, we must have a sufficient oxygenation ; take away oxygen and of course the cell dies ; reduce the supply of oxygen and the function of the cell is diminished. That is why the child's nervous system is so irritable, there is an oxygen famine. These cells will receive more oxygen under the treatment we have prescribed, because an increase in hæmoglobin means an increased oxygen supply to the tissues. This child's digestion is impaired on account of anæmia. You cannot expect the glandular cells of the stomach and of the intestinal follicles to provide good digestive fluid in a condition of anæmia. An increase of hydrochloric acid, alone, would be of enormous value, as a great many lower forms of life will not live in an acid medium, and in this way our attempt at sterilization of the intestine would be facilitated.

With regard to drugs, they are to be confined to the class of intestinal antiseptics. My views on this subject are all contained in a paper on "The Intestinal Origin of Chlorosis" (*American Journal of the Medical Sciences*). We used to think that the best intestinal antiseptic was salol, which is a salicylate of phenol and hydronaphthol, but I have been a little startled once or twice in using salol by getting symptoms of carbolic acid poisoning. As a result of this, I have given up salol altogether, and I use instead of it salacetol, which is almost the same combination, except that, instead of carbolic acid combined with salicylic acid, we have a combination of salicylic acid and acetol. To a child of this age you give one and a half decigrammes three times a day, or two and half grains. It is best given before meals. The hydronaphthol I have used more especially in cases in which I thought there was a process of putrefactive fermentation going on. The objection to it in children's practice is that it is not easy to take on account of the taste, and it is best given in keratine-coated pills. When you

can get a child to take it, however, it acts very well. You would be surprised to see the change which will take place in a child under this treatment in a short time. Other intestinal antiseptics I have used with comparatively good results. In this child I do not think that the salacetol will do the work. I should suggest, on the other hand, the arsenite of copper. In some cases this remedy has done more for me than anything else.

I have not said anything of iron; we will get along fairly well without iron, and better without it than with it until the intestinal fermentation is stopped; then we can talk about giving some of its preparations. Some other preparations, also, I have failed to mention. I have not mentioned creosote or sulphide of calcium. At some future time, I shall have occasion to mention these. We will also give this child some blood preparation, because we want to push the treatment as rapidly as possible, and we want the child to get well. The two blood preparations which I prefer are Kober's hæmol and hæmogallol. These are reduction products of hæmoglobin, and are stable. We give them in chocolate tablets just like quinine-tablets, and you will find that they work admirably. Now suppose you cannot get this preparation, you can get hæmoglobin; you can make it. Beef-juice is a very valuable preparation in connection with these cases. If you want to use an iron preparation, although I do not see any reason why you should want to do so, I would recommend reduced iron. My experience teaches me that the best treatment in these cases is, first the intestinal antiseptics, next the blood preparations, and next iron preparations. If you cannot get along without iron, give the carbonate of iron or reduced iron in powder form, equal parts of sugar and carbonate of iron; of this give a small quantity three times a day, but always in conjunction with the intestinal antiseptics.

THE ACUTE FORMS OF GASTRITIS.

CLINICAL LECTURE DELIVERED AT THE PARIS HOSPITAL.

BY PROFESSOR CHAUFFARD, M.D.,

Professor Agrégé in the Paris Faculty ; Visiting Physician to the Paris Hospital, etc.

GENTLEMEN,—Much has been added recently to our knowledge of the conditions which underlie disease of the stomach, and so many excellent methods of treatment have recently been suggested, that I propose to devote our time this morning to a consideration of the acute forms of gastritis. First of all, let us consider the group of acute diseases which are now much better defined and more thoroughly understood than they have been in the past.

It is often difficult to determine whether a patient is suffering from the acute or the chronic form of gastritis, as the symptoms of these two conditions may be associated. Then, again, it is not always easy to establish a differential diagnosis between acute gastritis and gastric ulcer. Acute gastritis to-day plays a very different part in pathology from what it did some fifty years ago. In Broussais's time every pathological condition was referred to an inflammatory state of some part of the digestive tube, and conclusions were deduced from this underlying principle. Fortunately, this idea has passed away, and the bad influence which it exerted on the science of medicine has been gradually removed. Nevertheless, gastritis still plays an important part in pathology, and a study of this condition will always be of interest and of great practical importance to the physician.

For convenience of study it is well to divide all forms of gastritis into three main divisions.

Group A.—All forms of acute gastric disorders which are localized in the stomach, but which are due to some general infection, such as scarlet fever, typhoid fever, or the like. Dr. Brinton has described a form of scarlatina in which the gastric symptoms were most pronounced,—namely, epigastric pain, vomiting, etc. At the autopsy the

gastric membrane was found deeply congested, considerably softened, the epithelium exfoliated, and the peptic glands distended with a granulo-fatty material. Then in the acute gastritis of typhoid fever, which it is of extreme importance to recognize, there will be acute pain, frequent vomiting, and evidence of irritation of the pneumogastric nerve. It will be found, on making pressure over the line of the pneumogastric nerve in the left side of the neck (*i.e.*, just in front of the middle of the sterno-cleido-mastoid muscle), that the nerve-trunk is very sensitive. In this form of gastritis it is the mucous membrane of the stomach that is attacked first. The lymphatics become involved secondarily, and thrombosis of the gastric veins may be produced, as is shown by small abscesses which open internally and produce ulceration of the stomach. These ulcers may be deep enough either to cause haematemesis or, if the condition is not arrested, to produce a perforation of the stomach, and lead to localized or general peritonitis. When such patients recover from the attack of typhoid fever they are apt to suffer for a long time from dyspeptic symptoms, due, no doubt, to defective action of the peptic glands of the stomach. There is a form of acute gastritis also which is known to attend small-pox. This condition has been well described in recent years, and it is due unquestionably to ulceration of the mucous membrane of the stomach. The same condition is often present in septicæmia. Of course, in all such cases the ulceration of the stomach is not a distinct disease, but is simply an evidence of the general systemic disorder. A thorough understanding, however, of such symptoms should be secured early in the case, and the proper treatment adopted to remedy the diseased condition.

Group B.—In the second division of cases we can place all those which are due to the presence of bacteria or their products in the stomach. In such cases there is acute purulent gastritis; but such a condition is rare and is seldom, if ever, diagnosed. The patient complains of a violent pain in the epigastrium, which is increased by taking food and by pressure over the stomach. Vomiting is always present with great thirst, and rapid emaciation follows. The purulent collection may be but a single one, and there is a case on record where an abscess opened externally, and yet the patient finally recovered. More frequently the pus arises from a number of small abscesses, varying in size from a pea to a chestnut, or there may be a true infiltration of the whole mucous membrane of the stomach. Such a condition is always fatal. In addition to these physical signs some other part of the body is always affected. There may be multiple abscesses with or

without arthritis. If gastric symptoms similar to those which have been described are present in connection with other evidences of septi-cæmia, a diagnosis of suppurative gastritis is permissible.

Group C.—In this division I wish to include all cases of acute gastritis or toxic gastritis. The stomach is said to be the most tolerant of all organs to the presence of foreign bodies. It is well known that pieces of glass and stone, and even forks and the like, have been swallowed without causing any local trouble. This third group may be again divided into several subdivisions in accordance with the manner of excitation of the stomach.

Division A includes all those cases where the irritating element has been swallowed. The substance so ingested may act either by its quality or quantity, or again by the active irritative principle which it may contain. In any case, an inflammation of the mucous membrane is produced and an acute form of gastritis originated. Food itself does not often act as an irritant, but by the fermentation which it produces may cause considerable irritation. Where there is gastric dilatation stagnation of the food is apt to occur in pockets and fermentation result. This may be the starting-point of an acute gastritis. Dyspepsia follows very closely on this condition. There are, moreover, certain causes of acute gastritis, such as the poison of gout and uræmia, which act along the entire gastro-intestinal canal, and may readily enough produce inflammation of the gastric mucous membrane.

Division B includes those cases which have been caused by the absorption of drugs. Such cases are by no means rare, as medicines are apt to act as irritants, not only in large doses, but also in small doses continued for a long time. Arsenic, for example, even in the form of Fowler's solution, is dangerous in this respect. The preparations of cinchona bark also are apt to cause gastric irritation, both on account of the alcohol which they contain and on account of the tonic principles in the bark itself. Preparations of cinchona should therefore be given after meals, and not just before, as is the custom in France. Their use should not be continued for more than two weeks at a time. Iron also causes gastric distress, and all preparations of nitrate of silver. Alcoholic drinks and strong wine taken between meals are prolific causes of gastritis. It is well to remember that almost all drugs will irritate the stomach, and that they should be used with great care and their action in this respect closely watched.

Division C.—This division includes cases of acute gastritis from the ingestion of poison. These, of course, vary most in the chemical nature of the substance and in the way in which they have been taken. The

irritating poison may have been swallowed by accident or by intention. More often it is a crime that has been committed, or a case of suicide, that you have to deal with. In such cases it is probably either some acid, a strong alkali, some preparation of either arsenic or mercury or phosphorus which has been swallowed. At the autopsy it will often be a difficult matter to determine the nature of the poison which has been used, as the gastric juice itself produces changes in the mucous membrane after death which are spoken of as post-mortem digestion. Putrid fermentation or the presence of any lesions in the gastric mucous membrane would increase this property of auto-digestion.

In the milder form of this variety of gastritis, frequently called the catarrhal form, the mucous membrane will be found red in spots and covered everywhere with adherent mucus. A microscopical study of the gastric mucous membrane will show a considerable distention of the blood-vessels in such a case and an enormous increase especially in the capillaries. The epithelium will be found desquamated in the form of shreds, which float on the free surface when water is poured over it. Between the tubular glands a considerable round-celled infiltration will be present, more pronounced in the superficial than in the deep layers. Such an infiltration is also seen in typhoid and scarlet fever; but in these diseases the lesions commence in the deep layers, —just the reverse, therefore, of the infiltration in the milder form. Moreover, if you carefully wash the mucous membrane, you will notice erosions over the surface, just as if some one had scratched it with the finger-nails. This condition has been well studied by Pilliet, who has found that it is produced by an interstitial hemorrhage, which lowers the vitality of the tissues along those tracks in which it occurs to such an extent that the gastric juice is better able to act upon them and an erosion results. These superficial erosions frequently rest on an inflammatory base which has a profusion of tortuous and dilated capillaries beneath it. If the gastric juice penetrates to these capillaries a hemorrhage may be produced which may lead to haematemesis. As a rule, however, the lesions are but superficial and they tend to a spontaneous cure, the epithelium being reproduced and the lesion disappearing. If, on the other hand, the lesion has been deep enough to cause a cicatrix to form, the result is harmful to the patient, as that particular spot is never able afterwards to reproduce the gastric juice.

The lesions which are present in any case of acute gastritis due to the action of poison must depend, of course, on the nature of the poison itself, its quantity, and the time it was taken, after or before meals.

In certain cases of arsenic-poisoning, if but a small amount of the drug has been used, we may find only a simple catarrhal condition, or, perhaps, some slight erosion. Filehne has found by giving large doses of arsenic to dogs, and at the same time enough bicarbonate of sodium to neutralize the hydrochloric acid of the stomach, that the lesions produced were trifling in extent. If the soda was not given, then the lesions were very decided. In such experiments fatty degeneration of the glands of the stomach could be readily demonstrated by the use of osmic acid.

THE CLINICAL ASPECTS OF CIRRHOSIS OF THE LIVER.

CLINICAL LECTURE DELIVERED AT ST. BARTHOLOMEW'S HOSPITAL.

BY SIR DYCE DUCKWORTH, M.D., LL.D.,

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GENTLEMEN,—A series of four cases of cirrhosis of the liver now in my wards provides me with some good material for to-day's lecture, and I am able to bring in one of the patients who will leave to-day for the Convalescent Home. We have three cases in males and one in a female. It is well known that the etiology of the disease we are considering to-day is a slow and chronic overgrowth in one of the essential tissues of the liver,—the fibrous element, and a corresponding and consequent atrophy or starvation of another tissue,—the cellular or secreting substance of that organ. Remember that these two processes go on together, and that, thus, you have an example of an organ which, though it is absolutely growing bigger, is also wasting away in respect of its most essential texture. Cirrhotic livers, then, be they ever so large and heavy, are really wasted and effete as regards their proper purpose in the economy. I might here throw in the remark that it were well always to think of the several viscera in the body as being personal, so to say, to the individual. One man's liver is not the same as another man's liver, and the kidneys in different people—healthy people, I mean—are practically different too. One person may have too active a liver for the needs of his system, and another may have too small a liver or too little liver-activity for his requirements. And so with other organs. We are too apt to think of the several organs of our patients as if they were all alike, and amenable to the same influences. You will find in practice that there is nearly as great a diversity of character in people's viscera and their modes of working as there is in their facial or external conformation. You will never

become good practitioners if you fail to appreciate this fact. Now, the tissue that takes on this overgrowth in cirrhosis is that known to anatomists as the capsule of Glisson. Dr. Francis Glisson was professor of Physic at Cambridge and president of the Royal College of Physicians a little over two centuries ago. In 1654 he first described the cellular envelope of the portal vein, which is now known to form also an areolar investment for the branches of the hepatic artery and the gall-ducts, and is then prolonged into the interior of the liver as a supporting matrix. Glisson was buried in 1677 in St. Bride's Church, Fleet Street, not far from this place.

Glisson's capsule is a complete areolar system in the liver. The peritoneal coat, you know, is imperfect, and where this is so, its place is taken by Glisson's capsule. You must have regard to all the fibrous or areolar textures of the liver, for, in truth, they all become involved in cirrhosis. This gradual fibrous or fibro-cellular over-growth comes to involve at once all the tissues in relation to it, and so we accordingly find that the principal vascular, the secreting, and the duct systems of this gland become involved in difficulties,—to wit, the hepatic artery, the portal vein, the hepatic cells, and the gall-ducts. The more cells seen, the younger the tissue. Dr. Legg has shown that the liver cells themselves may take part in this fibroid connective tissue conversion. What are the obvious results of this? Diminished flow of arterial blood through the liver, diminished flow of portal venous blood, checked production and impeded outflow of bile from the liver. This entails prominently the onset of congestion of the portal system, leading to the engorgement of the stomach, spleen, and intestines, with occasional bleedings from the free mucous surfaces of the alimentary tract, or from piles, to effusion of serum into the peritoneal sac, known as ascites, and to more or less jaundice. I say these are the obvious results, but there are many others less easily recognized. The liver is not merely an organ for the formation of bile. You know that important metabolic changes go on in it, having relation to the disposal of varieties of nutriment conveyed to it; and, again, there is the glyco-genic function which is in such close relation to the building up of the body and possibly to the maintenance of heat. Now, all these functions must of necessity be disturbed in every case of cirrhosis, but they do not give manifest and prompt indications of such derangement. Yet we find that patients with cirrhosis waste both as to their muscle and their fat, and often their bodily heat is lowered. Each of our patients affords proof of some of these points. I have said enough to convince you that cirrhosis of the liver is not the simple matter you

may have thought it to be. Many questions respecting its whole pathology still remain to be worked out. I am of opinion myself that while the stress of the disorder appears to fall upon the liver, the whole malady is one of a more general and widespread nature. I do not think all the textural faults found during life or after death are attributable secondarily to the diseased liver, and I am led to surmise that the causes which mainly attack the liver also bear injuriously on all the tissues. But I am not giving you a didactic or systematic lecture now, and we must pass on to consider the clinical character of the disease, more especially as illustrated in the cases now under survey. I am speaking to-day of alcoholic cirrhosis. You are aware that the liver may become hardened by other causes than alcoholic intemperance, of which the commonest are chronic heart-disease and permanent occlusion of the common bile-duct. True cirrhosis, certainly in its pathological if not its etymological sense, is an affection induced by alcohol. It is important to know that some persons are more than others prone to suffer from this disease. The power of the liver in dealing with alcoholic drinks varies much in different persons. Happy the man whose liver is intolerant of them save in such quantities as are useful to the economy. A very brief course of alcoholic intemperance may in some cases lead to cirrhosis, while in others many years may pass before the first symptoms of it appear. This is a warning to all who know this fact. The first case I take is that of C. G., aged forty, a butcher, admitted June 2, 1896. He is a tall, poorly-nourished man, obviously jaundiced, and looking older than his age. His features are sharp, and he has lost much of his fat. You observe several purplish spots on his forehead and face and arms, so called venous stigmata. These are very significant of alcoholic cirrhosis of the liver. Mr. Godart has made a capital drawing of these which I hand round. They consist of local, naevoid dilatations of small venules. Commonly there is a central, raised red spot with vessels radiating in a star-like way from it,—a veritable small *caput medusæ*. They fade for a moment on pressure. In another of our cases, I shall have to tell you of the occurrence of bleeding from such spots.

I consider them to be among the most important indications of the general, and not merely local, nature of the disease. This man has twice had rheumatic fever, and has been subject to palpitation of the heart since. He has not had syphilis. His history was that of morning vomiting for seven or eight months past, swelling of the belly for three or four months, jaundice for about six weeks, and wasting for two months. He had had no swelling of the legs, no pruritus, no diarrhoea,

no piles, no haematemesis, and no melæna. His tongue was furred in the centre and clean at the sides. His belly was large, the girth at the navel being thirty-three inches. The liver was readily felt below the right costal cartilages. The liver dulness commenced in the right nipple line, at the sixth intercostal space ; the edge was felt at the level of the navel, there being seven and a half inches of vertical dulness to percussion. The surface of the liver was smooth. The spleen was easily felt and distinctly enlarged. There was dulness in each flank, but only a slight percussion-wave on palpation. Slight fulness of the superficial abdominal veins was noticed. The chest presented many abnormal physical signs ; thus, there was a suspicious boxy percussion note under the left clavicle, and some friction sounds were heard in the axillary and postero-lateral region on that side. The heart's apex was not plainly felt, but there was a slight pulsation in the fourth left space within the nipple. The limits of cardiac dulness were normal. At the apex there was a hurried, paddling action, with an occasional systolic murmur, almost musical in quality. At the aortic base an onward murmur was heard. My opinion at that time was that these signs indicated a damaged mitral valve, with some degree of stenosis, allowing occasional reflux, and that the aortic valves were roughened and hardened. The pulse was of *plus* tension,—78. The finger ends were clubbed and dusky. The urine was of specific gravity 1015, slightly bile-tinged, void of albumen and sugar. There was a slight rise of temperature at night for a short time after he came in, 100.4° F. being reached. Afterwards, the morning temperatures fell to 97° and 96°, rising at night to normal. There was some cough, with muco-purulent expectoration.

We learned that this man had drunk freely, especially of gin-and-water. The diagnosis was not far to seek : alcoholic cirrhosis of the liver, with enlargement, leading to splenic enlargement, jaundice, and ascites ; rheumatic endocarditis, and signs indicating the existence of dry pleurisy, at least, about the left lung.

Light diet and fish were ordered, and chloride of ammonium in fifteen-grain doses, with taraxacum, was given thrice daily. The tongue soon cleaned, and remained so. Plenty of urine was passed. The jaundice deepened. The ascites diminished, the abdominal girth in a week's time being one and a half inches less. At the apex of the heart the systolic murmur gradually became more appreciable, and was faintly conveyed to the lower angle of the left scapula, the pulmonary second sound being accentuated. The bowels acted daily, there being some bile in the stools. On the 13th of June some diarrhoea came on, and

again on the 23d, treatment for this being purposely withheld. At this time the signs at the left pulmonary apex became more marked, there being evidence of consolidation and softening there. The girth of the belly remained much the same, and no change occurred in the size of the liver or spleen. On the 28th of June there was some epistaxis. Notice the hemorrhagic tendency in alcoholic cirrhosis of the liver. After attending the rehearsal of the hospital concert he was not so well. The temperature rose to 102° F., but the pulse remained at 72. This disturbance subsided, but some febrile movement was noticed henceforth, and an evening rise of temperature to 100.5° or thereabouts. He lost two pounds in three weeks, but has regained it since, and is now six pounds heavier than on admission. This man is up and about half the day, and is about to go to Swanley for a short time. I fear there is pulmonary tuberculosis to be added to the hepatic and cardiac disorders of this man. Bacilli have not been found in his sputa, but we must not halt in our diagnosis on that account. What is the prognosis here? Without doubt, bad. The true secreting elements of the liver are much destroyed, and a progressive cachexia is going forward. In this case there is the additional bad effect of the valvular heart-disease upon the liver, leading to a form of spurious, so-called cardiac or organic cirrhosis. The heart-disease, however, will probably retard the course of the pulmonary tuberculosis. Some check may be set to the progress of all his ailments by good diet, regular life, and treatment.

On a return to his usual surroundings the alcoholic habits will almost certainly be resumed, and aggravation of all the symptoms will ensue. Any considerable bleeding from the stomach, cesophagus, or other part of the alimentary canal may prove immediately fatal.

Time forbids me to give you in full, as I could wish, the details of our other cases. I must therefore utilize them to illustrate some important features of this disease. Some of you have already asked me how it was that in this and two other cases there was jaundice, and yet the text-books declare that this is not a symptom to be looked for in liver-cirrhosis. Now, nothing is more helpful to the honest study of medicine than the discovery of differences between the tales of the books and the tales of the bedside. On the main point at issue here the books are practically right. It is not usual to meet with jaundice in such a large proportion of cases as we have before us,—three out of four; but now and then we do find jaundice of more marked character than you might fairly expect from the accounts given in books. If you think of the matter, the wonder is that jaundice is not at least

as common as ascites. If Glisson's capsule be so specially affected, why do the bile-ducts escape when the portal-vein branches suffer so severely? We have to suppose that the biliary-duct system better bears the compression than the portal venules. I think we need not suppose that there is catarrh of the common bile-duct, or that enlarged glands in the fissure of the liver, compressing the duct, are the principal causes of the jaundice when it does occur. The duct system may suffer more than the portal system. The liver is generally found enlarged when much jaundice is present, but not always. Bear in mind that cirrhosis of the liver does not always entail ascites, although this is present in most cases. When peritoneal effusion of an inflammatory character occurs the nature of the fluid drawn off will commonly declare this. If ascites be absent, we may presume that a specially free collateral circulation has been established by various channels, and in such cases there is a risk of hemorrhage from some congested point, which may even prove fatal. You may ask what becomes of the compressed branches of the hepatic artery. They are found to supply the new cellular and fibrous overgrowth which is going forward, and, as the portal vessels become occluded, it is thought that the bile may be secreted from arterial blood thus brought.

The case of J. Y., aged forty-six, illustrates cirrhosis in an earlier stage, without ascites, but with severe hemorrhage. This man is a potman, and naturally a drinker. He is a pallid, wasted man. He had a soft chancre in his early days, but no constitutional symptoms of syphilis. He has been failing in health for a year past. He came in on June 24, with the history of having awakened one morning three weeks previously and vomited a large quantity of blood. He also passed some by the bowel. Within three weeks' time he had three more similar attacks, and fainted after the last one. Now, such a case is very grave. The man was blanched, and had a *bruit de diable* in both jugulars. The liver was not felt below the ribs, and was four inches deep in the right nipple line. There was a systolic apex-murmur. The pulse was sudden, and slumping from emptiness. The urine was free from albumen. After a careful consideration of this man's history I concluded that he had suffered from rupture of some distended veins or piles in the oesophagus or stomach. With suitable diet and saline aperients he made fair progress. He had a good deal of pain at the epigastrium occasionally, requiring opium for its relief. I do not think he had a gastric ulcer. At any rate, he had, save the haematemesis, no symptoms of it. The superficial veins of the abdomen were enlarged, and this was a clue to the real nature of the case.

The next case is that of W. C., aged forty-nine, admitted to John Ward on the 28th of May. As in the first case, there was a history of rheumatic fever ten or twelve years ago, and a history of brandy-drinking, his occupation being a barman. You will find him in bed now. On admission he was found to be lean, decidedly jaundiced, and the subject of ascites and oedema of the legs. No syphilitic history. He had been subject to gout in one great toe at intervals, and I may remark in passing that it is common enough, as you might expect, to find a gouty history in many cases of cirrhosis. He was also subject to winter cough. For about three months he had lost appetite, but there was a previous history of morning vomiting for two or three years. The belly had been swollen for five weeks. Diarrhoea had troubled him for two months. This is a sort of safety-valve symptom, due to the great portal congestion and catarrh of the intestines, and not, mark you, in any such case, to be treated *secundum artem* with astringents. He had never had any hemorrhage. His face showed injected capillaries, and characteristic venous stigmata. I will tell you first of the state of his heart before I describe the abdominal symptoms. The apex-beat was diffused, best felt in the fifth space in the nipple line. Cardiac dulness somewhat diminished. There was a systolic apex-murmur, heard in the axilla and at the lower angle of the left scapula; also one at the aortic base, heard up the vessels; an accentuated pulmonary second sound, and over nearly the whole praecordia a double exocardial friction-murmur. The pulse was 112, regular, of *plus* tension, rather sudden. The arteries were hardened and tortuous. The temperature was raised about one or two degrees above normal, and became subnormal in a few days. There were signs of slight general bronchitis, and of oedema at the base of the lungs, and some watery mucoid sputa.

The superficial abdominal veins were full, and fluctuation was readily obtained in the belly. The girth at the navel was forty-two inches. The front of the abdomen was resonant. The liver-dulness began at the sixth rib, and the edge was felt two inches below the cartilages, measuring eight and one-third inches in the nipple line. Its surface was seemingly smooth. The spleen was not felt. Light diet was given, and the hospital draught of broom-top decoction with tartrate of potassium and spirit of juniper was ordered. The ascites gradually subsided. The diarrhoea continued, one to eight motions being passed daily. The pericarditis remained, but gave only auscultatory indication of its presence. Some epistaxis occurred on June 6, and on the 16th bleeding occurred from one of the stigmata on the right side of

the neck to the extent of half an ounce. It required pressure with a pad of lint to stop it. Next day there was bleeding twice from the same point. On the 23d there was a rigor and vomiting, with a temperature of 105° F. No fresh physical signs. The next day the temperature was subnormal. The exocardial friction sounds continued. A trace of albumen appeared in the urine. The abdominal girth on June 29 was thirty-one and a quarter inches. On July 12 he was found stupid and slightly delirious. He was, and had been, taking for four weeks chloride of ammonium. He was now ordered the effervescent tartrate of sodium with some dilute hydrocyanic acid. This drowsy state lasted for nearly a week, and its occurrence was probably explained by the discovery a few days later of an empty six-ounce bottle of brandy which had been smuggled in to him. The mental state cleared off and the diarrhoea diminished. The nights being sleepless, some opium was given with benefit. The man is slowly failing and losing ground. The heart-disease may aggravate the liver mischief, as in the first case. You have here a large liver, undergoing no manifest shrinkage, and persistent jaundice.

Before I sum up what I have to say as to the size of cirrhotic livers, I will give you, lastly, the particulars of K. J., a married woman, age forty-four, admitted on June 30 into Elizabeth Ward. Mr. Adams, who sent her to me, said that he had attended her twice for what is recognized as *delirium à potu* in women. She was much jaundiced, spare, had been wasting for five months, and was very feeble. No syphilitic history. Three months ago she was "bilious," and had vomiting. Six weeks ago jaundice was first noticed. Three weeks ago there was pain in the right hypochondrium and occasional epistaxis and bleeding from the gums. No haematemesis. The first sound of the heart was slightly blowing at the apex. The pulse was 124, small and feeble. The temperature the first night was 102°, and afterwards rose at night to a mean of 100.5°. The abdomen was distended, and the superficial veins enlarged. Ascites moderate in amount. Liver felt two inches below cartilages, dulness beginning above between fifth and sixth ribs, measuring in nipple line six and one-half inches. Surface apparently smooth. Spleen not felt. Some oedema of legs. Hands tremulous. Slight delirium at night. The ascites increased daily, also the jaundice. The urine very bilious and slightly albuminous. On July 8 she was tapped with a Southey trocar and canula, eight pints of yellowish fluid being collected in seven and a half hours. The liver was more plainly felt afterwards. Next day some epistaxis, but much relief from the tapping. The abdominal puncture was allowed to drain into

an antiseptic dressing for a day or two. On the 15th there was some diarrhoea, which was very troublesome, and at the patient's request I sanctioned the administration of some chlorodyne, which much relieved her. The motions became semisolid and pale. July 29: Much the same. For some time past there has been a suspicion of friction over the pericardium. The gums bleed occasionally, but are benefited by alum and a sulphate of zinc lotion, with tincture of myrrh. This, then, is another case of alcoholic cirrhosis with enlargement. Note that ascites may occur with enlarged liver, and is not only to be met with when the organ is shrunken. Jaundice is more marked here than in any of the four cases I have described, and the hemorrhagic tendency is also pronounced. The smallest livers due to cirrhosis are to be found at the last stages of the cases. It is commonly taught that the liver is enlarged in the early stage, and goes on shrinking. This is true in the main. But you must not expect to find proof in each case. My experience leads me to say that the organ is certainly enlarged from an early period. This is quite intelligible. There is a new growth going on and additional material being thrown out. At first this is mainly a cellular material, but as it grows older it becomes fibrous, and tends to shrink and contract, compressing islets of secreting texture. I am further prepared to say that the general shrinking of the whole liver is often so gradual that it is barely perceptible, or only when examination is made at long intervals. I think the evidence of contraction is quite as much shown by the falling away of the organ from the abdominal wall. In a recumbent posture the liver is felt deeper down and farther from the surface, its vertical limits being apparently unchanged. It is certain that many patients die of cirrhosis with large livers, weighing over the natural limits of fifty to sixty ounces. You are aware that a form of hypertrophic cirrhosis has been described, and is alleged not to be due to alcoholic influence. The fibroid change is said to begin in and among the lobules and in the interlobular veins, there being much jaundice and no ascites. This form is known as biliary cirrhosis, the bile-duct being dilated and full of bile. The surface of the liver is smooth, and the organ may weigh six or seven pounds. I feel sure that in most instances this is only a variety of alcoholic cirrhosis. This condition is simulated by persistent obstruction to the common bile-duct, by cancerous stricture, or by a calculus.

Again, we meet with cases of fatty cirrhosis with enlargement of the organ, there being an excess of fibroid tissue and of fat. These cases are common, and occur most frequently in beer-drinkers. In all

these forms you must remember that there is really an inadequate amount of normal hepatic texture to perform the necessary functions of this important gland.

You must not expect to feel in most cases of cirrhosis any particular roughness of the surface. What are called "hobnails" or, in Scotland, "whiskey tuckets" are impalpable. Deeply scarred or roughened surfaces of the liver are due either to syphilitic growths or to cancer. Granules of fat in the abdominal walls have often been mistaken for "hobnailed" roughness in the atrophic cirrhosis of Laennec.

With respect to the prognosis, the outlook is in most cases grave. By the time the diagnosis is easy the mischief is usually far advanced. Cases vary in duration. This is due to the individual peculiarities of the hepatic tissue or to the special habits of the patient. In the early stages of the disease, after tapping the belly, and after the use of medicines, combined with the truly temperate use or the complete relinquishment of alcoholic drinks, a cure may sometimes be met with. Too often we can secure only an amelioration of the symptoms. With the progressive contraction of the liver we find an increase of the ascites. If a new circulation is set up for the portal venous branches, there may be a temporary respite, but even then there arises a liability to hemorrhages from the oesophagus at its lower end (piles), or from any point in the stomach or intestines. Such haematemesis is most grave and often copious. A first attack of it may prove fatal, and a second or third certainly so. Lastly, a form of toxæmia may set in, the patient passing into the typhoid state with delirium, coma, and some pyrexia. This has been termed cholæmia, and attributed, wrongly as I believe, to cholesterine-poisoning. It is doubtless due to the entry into the blood of ill-metabolized products, which act as toxines upon the brain and nervous structures. Life will certainly be of short duration after the toxæmia sets in.

As to treatment. Here, as always, we regard the patient as much as his malady. There is no treatment for diseases, but much for patients. Repeated tapping is often necessary and useful in the early stages. Saline remedies, especially the soda and magnesium sulphates, are of great service. The effervescing tartrate of sodium with some preparation of cinchona bark is often useful. Occasional doses of calomel, three to five grains, are very helpful. The diet should be milky and farinaceous, but animal food is not contraindicated. Fresh lemonade is advisable, and all alcoholic liquids are to be withheld. Later, chloride of ammonium and mineral acids, with quinine, may be

given, and all efforts made to raise the general level of nutrition of the body.

Diuretics are hardly advisable. Gentle purgations are more helpful. The toxæmic state may be benefited by doses of calomel. It is unwise to remove ascitic fluid in this condition, even when it threatens to carry off the patient, for it is found that the toxæmia may be thus aggravated or precipitated. Dropsey of the legs will not require any particular treatment in these cases.

AUSCULTATORY PERCUSSION.

CLINICAL LECTURE DELIVERED TO THE SENIOR CLASS OF THE MEDICAL DEPARTMENT, UNIVERSITY OF BUFFALO.

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GENTLEMEN,—We are to study together, this morning, the general principles of the art of locating organs by means of auscultatory percussion. This method of physical examination, though quite fully elaborated more than fifty years ago, has never become popular; it has never, so far as I am aware, been regularly taught in any medical school, and it is an almost unknown branch of medicine. Thus, the few physicians in the country who have used or are using it have been almost entirely self-taught, and have been forced to independent if not strictly original research, with scarcely any help from teachers or textbooks, other than an occasional brief mention of the existence of such an art.

My personal experience has been about as follows: Shortly after graduating, I became aware that there was such a thing as auscultatory percussion, and endeavored, with very little success, to learn something more about it. Then, after a few years, I made a more thorough but still quite unsuccessful study and laid the method aside as practically useless. Two or three years ago my attention was again called to the matter by an excellent article in some medical magazine, which told how the author had located organs post-mortem and had verified his results by section, which informed the reader that an ordinary stethoscope could be used, whereas the older authorities had insisted on the employment of a wooden monaural instrument, and which encouraged me to make a renewed trial of the art. After three or four months' experimentation I found myself tolerably proficient, at least so I thought, but my medical friends were, to say the least, sceptical

in regard to my own or any one else's ability to turn the method to practical account. This scepticism led me to a still more thorough study of the subject, which I embodied in a paper presented to the Medical Society of the State of New York last year. I have endeavored in vain, both by searching the files of magazines and corresponding with editors, to learn the name of the gentleman whose excellent article led me to make a third attempt at the subject.

I am glad to learn that none of you have had any instruction or experience with auscultatory percussion, because I hope to demonstrate, as I did to the senior class that preceded you, that the method is so far from being impracticable that, under favorable circumstances, you will be able to locate organs immediately without any previous training.

The term auscultatory percussion is objectionable, since auscultation refers to any method of physical examination in which we use our ears. In this sense, all percussion is auscultatory, except as one learns by long experience to feel rather than hear the vibrations induced by the plexor finger. Auscultatory percussion is percussion in which we use the stethoscope, but it is not ordinary percussion made more accurate or more easy by the aid of an instrument, as is the case with stethoscopic or mediate as opposed to aural or immediate auscultation. Not to give you a stilted definition, perhaps I can best explain what auscultatory or stethoscopic percussion is, and how it differs from the ordinary form, by reference to different articles in the room. If I rap on the table and then on the radiator, you can easily distinguish the materials by the difference in the percussion note. When I was a student my chum and I used to practise on the wall, determining where it was hollow and where there were studs behind the plaster. Suppose, however, the problem was not to determine a difference in material, but was simply one of continuity. Thus, if you were all blindfolded, and I rapped on the backs of the benches of the amphitheatre, you would recognize no difference in the pitch and quality elicited from the different benches,—that is, unless there happened to be some difference in their construction,—but you could easily tell when I rapped on your own bench by the increased force with which the vibrations reached you.

In auscultatory percussion we place the stethoscope over an organ in the area in which it is in immediate contact with the body-wall or in which that condition is fulfilled as nearly as possible. We then percuss, approaching or receding from the instrument, and note that at one point the percussion strikes the ear forcibly, while a fraction of an inch away the sound is muffled and there is no sense of auditory

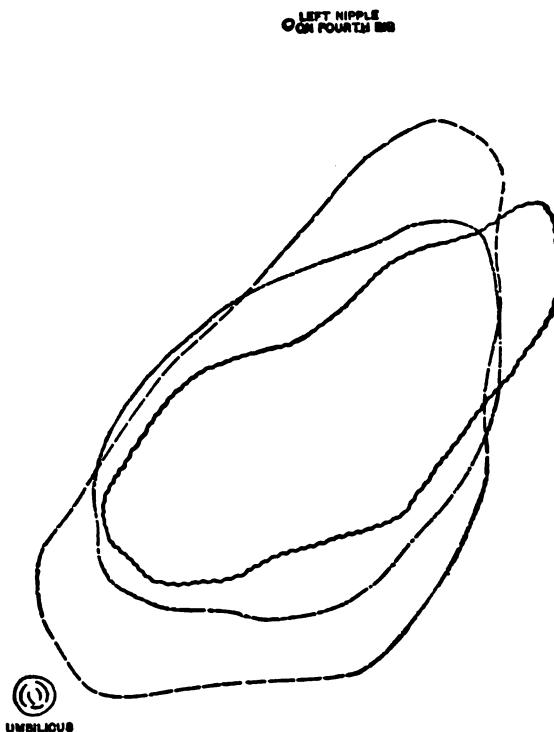
shock. Now, I will ask two or three members of the class to come down and listen with their stethoscopes over the superficial gastric area, while I percuss upward and downward and then from left to right. The gentlemen have all agreed that the sharpness of the sound changes when I pass a point about an inch higher than the umbilicus, in the parasternal line, and at the median line in locating the right extremity of the stomach. With a qualification to be made later, these points are correctly located, although it is the first experience that any of the gentlemen have had with this method.

Some of you will ask, however, How do we know that we have marked out the limits of the organ? Of course, in a case like this, we must depend on inductive reasoning and upon experience previously acquired. Last year I made a trial of this method at the morgue, located the stomach by pins driven through the abdominal wall, and the section showed that the localization was correct, except, as I had anticipated and stated, at the right end where the organ usually dips down too deeply to be thrown into vibration by the percussing finger. Such a demonstration, in the presence of the class, with the pathologist acting as an entirely impartial judge, is quite convincing, and inspires confidence in the ability to obtain correct results. This is only one of many instances in which the limits of organs have been verified at the autopsy. However, I must not give you the impression that one never fails with this method. I well remember offering to demonstrate the method to some sceptics, who took me to one of the hospitals and gave me a subject on which to try to locate the liver. My result was a flat failure, but it is only fair to say that the subject had been dead four days, and the body, lying without embalming in warm weather, was decomposed and the abdominal cavity enormously distended with the gases of putrefaction.

In the case of the stomach, it is often quite easy to determine the lower border by ordinary percussion, especially when we distend it with air or water through the tube. By this means and others we can verify the results of auscultatory percussion.

Now, I will ask some of the other gentlemen to come down and locate the heart. We might make a chart of the whole organ on the patient's chest, but we will content ourselves with marking the right, left, and upper limits, which, with the palpable apex-beat, afford all the data necessary for any ordinary examination. These points, as we are all practically agreed, fall upon the third rib above, in the nipple line or perhaps a hair's breadth to the left of it, and about half-way between the median line and the right border of the sternum. The

upper and left boundaries are quite readily made out by ordinary percussion, though the stroke is harder and more uncomfortable to the patient than the gentle tapping used in auscultatory percussion. In locating the right border of the heart we have shown that the latter art has the advantage of being within the capabilities of the average man. Considering that the gentlemen who have just made the examination have never had the least experience in such work, my remarks



Progressive diminution of the area of a dilated stomach.—The heavy dashes outline the area of dulness on November 28, taken three hours after eating; the alternate dots and dashes indicate the amount of distention of the stomach on January 17, six hours P. C.; the waved line, February 18, gives the position of the stomach when distended with vapor which was spontaneously discharged.

are not uncomplimentary. There are men who claim that they can always map out the right border of the heart by ordinary percussion, or that they can always distinguish a tricuspid murmur, or that they can invariably dispense with the abdominal damper, in differentiating between the wave of ascites and that of fat in the subcutaneous tissues. Without questioning the truthfulness of these gentlemen, I simply wish to say that I cannot map out the right border of the heart by ordinary

percussion in more than half of the cases ; that I cannot always be sure of the presence or absence of a tricuspid murmur ; that I do not pretend to diagnose an ascitic wave without applying the edge of the hand to the abdomen to shut off a wave of fat, unless the abdomen is distended and the case a plain one, therefore I feel that a method which renders a difficult problem easy, and which places itself at the service, not only of men of exceptionally accurate ears and fingers, but of the rank and file of the profession, is one that deserves cultivation.

In this same connection I would like to have one of you try to locate this patient's spleen, first by ordinary percussion and then by auscultatory percussion. By ordinary percussion your class-mate is able to say only that the spleen is certainly not enlarged. I can, by heavy percussion, make out a small area of dulness, but the result is not satisfactory. There are those who can always find the spleen when it is normal, but they make me think of a physician who once called me in consultation. I remarked, after examining the patient, that the liver was enormously enlarged, and that, whether due to this fact or not, the lower lobe of the right lung was consolidated and that there was beautiful pectoriloquy. The doctor listened to the chest, and assured me that he could hear the pectoriloquy though the patient had not uttered a word. Most physicians frankly acknowledge that they cannot find a normal spleen, and that they consider the existence of an appreciable area of dulness as indicative of enlargement. Here, by auscultatory percussion, we have made out an irregularly circular area in the left infrascapular and axillary regions, with a diameter of about two and one-half inches, which is within the normal limits.

In the case of the heart, spleen, liver, and stomach, the organs to which my examinations are usually confined, it is of tremendous importance to know merely the size of the organ. The heart, with rare exceptions, is either normal in size or too large. If too large, we must differentiate on functional grounds between hypertrophy and dilatation. Except for pathological conditions, only demonstrable at the autopsy and rare instances in which vascular thrill is communicated to the spleen, the physical diagnosis of disease of this organ is limited to the question of size. Unless we can demonstrate enlarged veins of the abdomen or rectum (hemorrhoids), ascites, or jaundice, almost the only physical evidence of the state of the liver is its size, in connection with that of the spleen, obstruction to the portal circulation damming back the blood into the latter organ. The proper understanding of the stomach also depends largely upon its size and location. In fact, many go so far as to say that if the stomach is not so distended and relaxed

as to be unable to propel its contents into the intestine, we need not worry about its chemistry.

It has seemed better at this first demonstration of a new art to select a patient with organs of normal size rather than one presenting some interesting abnormality. This choice of patient reminds me of a Philadelphia physician who used to give clinics at Blockley Hospital. He would have a nurse hold a well baby in her arms, while he lectured on whatever subject best pleased him, and perhaps would not refer to the "case" during the entire hour.

In practising auscultatory percussion an exact knowledge of the regional anatomy of the viscera is absolutely necessary. I must confess, however, that an instinctive knowledge of locality is often of more use than a formal remembrance of bony landmarks. Moreover, when one considers the various shapes that the lower part of the thorax assumes, and the difference in length of the spinal column of different individuals, it scarcely seems reasonable that the same arbitrary landmarks should apply in all cases.

I have already told you that the stethoscope must be applied somewhere in the area in which an organ is in contact with the body wall. In the case of the distended stomach—note that I say *distended*, not *dilated*—there is quite a large elliptical area, with its axis diagonal, reaching about to the mid-line and with the centre about two inches higher than the umbilicus. The area of the colon is a narrow strip nearly in the umbilical line and usually immediately beneath the stomach. Although it is theoretically possible to follow a loop of small intestine for a short distance, I have never found any practical use for auscultatory percussion in this connection. The superficial area of the liver is in the nipple line from the sixth rib to the costal arch. The superficial cardiac area is almost exactly in the circle in which tricuspid murmurs are best heard. For the lungs any place not over the heart, liver or spleen, or dense masses of muscle or bone will answer. For the spleen, the stethoscope should be placed about three inches to the left of the spinous processes and over the ninth or tenth rib. More or less experimentation is usually necessary. For the pregnant uterus, a spot must be selected where intestine does not intervene, as shown by dulness on ordinary percussion. However, there is no practical use in locating the uterus by auscultatory percussion when it is easily palpable.

I have already stated the approximate limits of the stomach, heart, and spleen. Bear in mind that tracings which we make in auscultatory percussion are not necessarily projections of organs on the body

wall, any more than the points at which the clinician locates heart murmurs represent the valves anatomically. Mark Twain, in describing the training of a Mississippi pilot, graphically portrays the varied appearances of the same stretch of river in the day, at night, in shade and sunshine, fog, mist, and rain. Each one of the false images must be borne in mind, yet behind them all is the true and relatively unvarying map of which a correct mental picture must be formed. So, in locating organs, we must remember the true anatomical position, then the tracings that we may expect to find in various normal conditions of physiological change in the organ itself, or of different degrees of obesity and leanness, and, finally, we must note any absolutely morbid displacement.

The dome of the liver rises as high as the third rib in the nipple line, but we need not expect to find it till it approaches the thoracic wall, at the fourth rib. The nipple is usually over the fourth rib, but either or both may be displaced, even in men. Many excellent clinicians speak as if they could not find the liver higher than the level of absolute flatness, at the sixth rib. Even by ordinary heavy percussion it can almost invariably be found at the fourth rib, and, unless intestine interfere, it should be traced down to the costal arch in the nipple line, while the left lobe is easily palpated in the epigastrium. Auscultatory percussion is of especial value in enabling us to locate the left lobe, including its extreme margin, and in deciding as to the lower margin even when intestine produces tympany on ordinary percussion. In many instances a diagnosis of contracted liver has been made simply because its lower margin was overlapped—or rather underlapped—by resonant intestine which would obscure the flatness of the liver tissue. Sometimes, even the precaution of making a number of examinations is unavailing.

I would urge upon you the practical value of a thorough familiarity with auscultatory percussion. By it you can obtain many results more easily than by other means, and you can, in many instances, surpass the possibilities of ordinary percussion. In every new case, whether the symptoms point to gastric, hepatic, or intestinal disease,—I omit the pancreas because its symptoms always point to some other organ,—it is my custom to determine the size and location of the stomach, liver, heart, and spleen. If there is any abnormality of the first two, the marks of the dermograph are reproduced on paper and filed away in the same envelope with other notes of the case. There is thus provided a life-size map of the organ at fault and a comparison with later examinations may be readily made. Besides

the name and date, it is important to state the time after eating on charts of the stomach. The spleen, being located at the side and back of the trunk, does not afford a useful map, as the paper folds part-way around the lateral curve of the body, and, hence, the size of the organ is exaggerated. I have brought a few of these maps to illustrate the simplicity of the method. Here is an exceedingly interesting chart of a cancerous liver made post-mortem and verified at the section. You can see the perforation of the pins by which my findings were submitted to the pathologist. This piece of wrapping-paper with the advertisement of a dry-goods store shows that the examination was made at the patient's home. The tracing shows the dislocated stomach of advanced pregnancy. Organically speaking, there was no gastric abnormality, since we must consider any necessary modification of pregnancy as within physiological limits.

It is hardly necessary for me to remind you that the severity of dilatation of the stomach depends rather on the ptosis and failure of motor power than on the actual increase of capacity. The first tracing (marked with dashes in the cut) was made November 28, three hours after dinner, but the patient had vomited most of the meal only half an hour before the examination. Still, the stomach was distended with gas. The second chart (marked with alternate dashes and dots) was made January 17, six and one-half hours after breakfast, but with the stomach distended with menthol vapor, after lavage. A third tracing, represented in wavy lines, marks the condition on February 18. This was also taken immediately after inflation with menthol vapor, but the stomach had so far regained its tone that spontaneous evacuation through the oesophagus occurred. The change from a stomach sagging to the umbilicus, unable to digest food, and almost equally unable to propel its contents onward for vicarious digestion in the intestine, to a firm, retracted, and mechanically perfect organ, has been accomplished by careful lavage, the menthol spray, a moderate restriction of diet, and appropriate medication. No electricity was used. I am glad to be able to say that my purely clinical disgust with electricity in such cases has been corroborated by experiments on animals by Dr. Turck, of Chicago, who has found that neither galvanism, faradism, nor the sinusoidal current produces contractions of the stomach itself, though the diaphragm and abdominal muscles do respond. The case is only cured so far as the dilatation is concerned. Considerable failure of chemical function still remains, and this will disappear slowly.

[NOTE.—This case was practically well by the middle of April.]

A CASE OF ACROMEGALY, PHOTOGRAPHED IN 1885, BEFORE MARIE'S PAPER APPEARED.

BY JAMES FINLAYSON, M.D.,

Physician to the Glasgow Western Infirmary and to the Royal Hospital for Sick Children, Glasgow, Scotland.

GENTLEMEN,—The circumstances connected with this case are interesting in some respects. A man, aged thirty-five, was admitted to my ward in the Glasgow Western Infirmary on January 23, 1885. He had what was regarded as a chronic rheumatic affection of various joints, with a sense of crackling on moving them. He was treated pretty successfully, as regards the joints, and was able to walk or even run a little before he left.

My attention was arrested by his peculiar appearance. He was five feet seven inches in height. His head was remarkably long from before backward, the hands were large, and the fingers broad and flat. The legs were thick and flabby, and the feet very broad and flat. Again and again I commented on his appearance, and one of my former pupils, seeing the interest taken in his case from this point of view, kindly photographed the patient in two different postures, one, the larger of the two, to show the upper part of the body, the other to show the feet as well. The former is here reproduced (see Fig. 1), the hands having been arranged so as to be well seen. The patient had lost an eye long before.

There was a supposition, on the part of the patient, that his hands had become larger than they had formerly been, but no accurate account of the changes in his appearance was obtained.

Some of the students, or resident assistants, seeing the interest I took in the man's appearance, informed me that in the ward of my colleague, Dr. Gairdner, in the same infirmary, there was a man who looked like the brother of my patient, but was really quite unconnected with him. I went to the ward indicated, saw this patient, and was also struck by the great resemblance to my case.

In 1894, in the *Glasgow Medical Journal*, Dr. George S. Middleton published, with photographs, "A Marked Case of Acromegaly with Joint Affections." (This has since been published in his "Clinical Records from the Glasgow Royal Infirmary," Glasgow, 1894.) On reading his case, I found that the patient he described had been formerly in Dr. Gairdner's ward, and from the photograph I recollect his general appearance. On looking up the dates, I found they agreed. As Dr. Middleton explains, Dr. Gairdner, like myself, had been struck by the physiognomy of *his* patient, and had made a long note, in January, 1885, on the subject. Of course, this note of his and this photograph of mine were before Marie's Thesis appeared in 1885. But I could make nothing of my case except to preserve a photograph.

On having my attention recalled to the case, I made inquiry as to whether the patient could be traced; but I found that he had died, and so nothing further could be learned.

FIG. 1.—A case of acromegaly photographed in 1885.



THE DIFFERENTIAL DIAGNOSIS OF ASCITES.

CLINICAL LECTURE DELIVERED AT THE COOK COUNTY HOSPITAL.

BY ARTHUR R. EDWARDS, A.M., M.D.,

Professor of Therapeutics in the Northwestern University Medical School ; Attending Physician to Cook County Hospital, and Pathologist to Cook County, St. Luke's, and Wesley Hospitals, Chicago, Illinois.

GENTLEMEN,—In the several cases we present this morning there is distinct abdominal enlargement, suggestive of gaseous, fluid, or solid distention. In some there is obviously an ascites, in others the character of the enlargement is more or less doubtful. The logical analysis endeavors to determine whether an ascites actually exists, and, if the enlargement is ascites, to ascertain the etiological factors, mechanical or cachectic, and, by a process of exclusion, whether the effusion is transudate or exudate, and if local peritoneal disease exists. We will consider only the diagnostic aspect of the question. Affections simulating ascites must first, then, be excluded. The first case is one in which coprostasis is the sole notable clinical feature. The faecal accumulations cause dulness in either flank simulating fluid, but the history and immobility of the dulness preclude error if differentiation by enemata and catharsis is employed.

The affections with which ascites may be confused are several,—hydronephrosis, hepatic hydatid, pregnancy, dilated bladder, tympanites, and even a dilated stomach. The diagnosis from ovarian cysts is usually readily made by their asymmetrical development, the dulness being anterior with tympany laterally; by a linear periphery; facies ovariana; by but slight change on alteration of position; by their pointing forward; by the fact that the uterus is drawn upward; by the higher specific gravity of their contents (1018 to 1024) and its thicker consistence; by the presence in it of paralbumin and cylindrical epithelium, and by the fact that the navel is negative. In ascites, the distention is symmetrical; the dulness is lateral, and tympany is uppermost; the periphery of the dulness is irregular; the change on alteration of posture is great; the bulging is lateral; the uterus is always

movable, it weighs less than the normal, and the vaginal vault is low; the specific gravity is usually less (1014); the fluid is usually clearer; paralbumin is rare except in gelatinous exudates; the cells are flat endothelium and the navel points anteriorly.

Since you have frequently observed the demonstration of free peritoneal fluid, we will hastily review only the salient signs of hydroperitoneum and lay more especial stress upon exceptions. Five hundred to one thousand cubic centimetres are necessary for clinical detection. With small effusions one examines the patient in the genupectoral position, the best method, according to Leube. Elevation of the buttocks causes scanty fluid to gravitate to the flanks for its easier demonstration. It is not necessary to dilate upon the fact, already familiar to you, that free fluid gravitates to the lowest parts and that the gas-distended gut is supernatant. Classically, therefore, the fluid in dependent parts gives dulness and the intestines are located by tympany in the highest parts of the abdomen. According to physical laws, these areas must vary with change of position, always giving, in uncomplicated cases, tympany above and dulness below. Since we are emphasizing exceptional clinical characters, this law lapses when the mesentery is retracted and does not allow the gut to float, in which event there is dulness over the highest areas on superficial percussion, though tympany can be elicited on deep percussion. Adhesions between the intestinal loops defeat shifting of the fluid. Two lines of tympany in the flanks designate the colones ascendens et descendens, replaceable by dulness from scybala. Gut adherent anteriorly determines permanent tympany there. Meadows has described tympany in the flanks in ascites due to extensive adhesion of intestinal coils to the lateral abdominal parietes. Edema of the subcutaneous tissue renders percussion of the abdomen difficult, as do fatty abdominal walls, fatty omentum and mesentery. Fluctuation (ballottement), due to the transmission of a fluid wave from side to side, is usually present, but may be absent because of tense abdominal walls or great fluid accumulations. Pseudo-fluctuation may be simulated by accumulation of fluid other than ascitic, as intestinal contents or by lax abdominal walls, in which, however, a third hand placed in the median line of the abdomen will break the deceptive wave due to superficial vibration. The attitude is that observed in pregnancy and the abdomen resembles that of a batrachian (*ventre de batracien*). The pale, tense, striated, oedematous, possibly inflamed skin, indefinite gastro-intestinal symptoms, a pouting navel, the diastasis of the recti muscles, thoracic symptoms, etc., are highly equivocal and, *per se*, are merely symptoms.

In the second case presented, the patient, a man aged forty, complains of great abdominal pain and distention, with anasarca of three months' duration. He has a temperature ranging from 99° to 101°, an accelerated pulse (100), and rapid respiration (30). There is some albumin in the urine, but no casts. His heart and lungs are wholly negative. There are no râles nor pleural adhesions. Abdominal examination reveals a distinct, more or less symmetrical, distention, and the abdominal walls are somewhat glazed. There is anasarca of the lower limbs, with distention of the subcutaneous abdominal veins. Percussion gives a general peculiar muffled tympany, nowhere perfectly pure, and each percussion stroke conveys to the passive finger a sense of resistance. In the left flank there is localized dulness not changeable with change of position, boggy to the finger, not resistant, as is a hard tumor, and persisting after administration of catharsis and colonic flushings for a week. There is no free fluid in the cavum peritonei, and palpation is attended by considerable pain. A trocar introduced into the dull area voids a yellow-reddish fluid of 1020 specific gravity and 4.7 per cent. albumin. We are impressed by the negative examination of organs external to the peritoneum and its contents, by the absence of the etiology and symptomatology usual in ascites, by the temperature, by the doughy abdomen with evident partial arrest of peristalsis, together with a localized hemorrhagic exudate. We can therefore diagnose tubercular peritonitis and advise laparotomy with fair hope of recovery. We will recur to the diagnosis after consideration of the several cases *seriatim*.

The third case is a Swede, aged thirty-six, from whom little history can be elicited except that for three months he has emaciated, lost muscular power, and has suffered from intestinal irregularities. His urine is negative. The thorax is negative except for an apparently complete synechia of the right pleural cavities, a point to which we must revert in considering the serious possibility of a tubercular peritonitis. He is emaciated and the skin is dry. The relative prominence of the abdomen contrasts with the thin arms and legs and narrow thorax. There is tympany in both flanks, as a fairly wide zone and over the entire antero-mesial portion of the abdomen is absolute flatness. On palpation a marked resistance exists which is not muscular, since we employ the "thrusting palpation," which surprises the muscles before they can contract and allows deeper palpation. The flatness does not change with position, and a trocar introduced into its midst gives a sanguineous fluid of 1022 specific gravity, and hence 5.4 per cent. albumin. The temperature ranges between 99° and 101.6°.

F. Thus far the examination does not vary greatly from the findings in the second case, but rectal exploration reveals a large, broad, hard nodular mass in the right inguinal region which is not in the rectal wall, but beyond and separate from it. We at once suspect neoplasm, a suggestion conformable with the localized peritonitis, bloody serum, and progressive cachexia. The old pleural adhesions, the temperature, and localized peritonitis, collectively considered, would also warrant a diagnosis of tubercular peritonitis, against which the hard, extensive nodular character of the formation found per rectum would not necessarily militate, insomuch as in a case of adipose ascites, already reported, large, hard, tumor-like masses in the same region were proved at autopsy to be relics of an ancient cased tubercular peritoneal exudate. With the latter considerations the obvious therapy is abdominal section, justifiable to establish the diagnosis for prognostic and therapeutic ends.

Granting that ascites actually exists in a given instance, the diagnosis is still incomplete, since ascites is but a symptom, if we except the so-called primary or essential ascites of French writers. The first inquiry, logically, relates to the etiology, but the etiological differentiation can be attained only by a process of careful elimination. The rectional method endeavors to distinguish between hydroperitoneum (or ascites) and peritonitis effusiva, a separation between which is not, however, always possible, since they occasionally occur conjointly. The best differential schema to follow is, in my judgment, the following:

- (A) Is the ascitic accumulation due to a mechanical agency (increased pressure)? Is it then a *hypostatic transudate*?
- (B) Is it due to increased permeability of the blood-vessel walls? Is it a *cachectic hydrops*?
- (C) Is it due to exudation, *inflammation*?
- (D) Is the cause some *local peritoneal lesion* other than inflammation?

A. Considering the mechanical question, it is necessary to investigate the condition of each intrathoracic organ. Diseases of the pericardium, myocardium, endocardium, and aorta should be definitely determined or positively excluded. Disease in the lungs, pleuræ, spinal column, diaphragm, and mediastinum may cause hydrops peritonei. Excluding disease in the structures enumerated, mechanical stasis in the cava inferior above the liver, in the hepatic vein, in the liver itself, or in the portal vein system, should be considered.

A 1. Considering the heart, we need not enumerate the various

diseases of the organs causing ascites and anasarca, but confine our attention to the hydrops produced by heart-disease in the broad sense of the word. In heart-disease the hydrops extends *upward* from the feet, the ankles and legs having been swollen prior to involvement of the peritoneum. In estimating the responsibility of the heart to a given ascites, the physical signs of cardiac disease are invaluable, such as dilatation or hypertrophy of the different heart chambers, accentuation of certain tones, the character of the pulse and its tracings, cardiac murmurs, cyanosis, etc., whose combinations are varied and more or less typical. In cardiac disease, dyspnoea usually antedates anasarca and ascites, in which connection we remark that secondary dyspnoea, due to pressure of an ascites upon the lungs and diaphragm, is secondary chronologically as well as etiologically. Hydrops of the serous cavities may exceptionally occur without anasarca, especially in *concretio cortis cum pericardio*.

The case we study next is a man in whose history alcoholism and long-standing anasarca in the lower extremities are the only prominent items. His face is very cyanotic and the skin about the ankles and posterior surface of the body is oedematous. The lungs are filled with crepitant râles, and the respiration is labored and noisy. The left ventricle is dilated, the pulse is fast and irregular, and, though the heart tones are weak, there are no cardial bruits. The urine is negative. The liver is symmetrically enlarged; tender and free ascitic fluid is found. The patient is an instance of myocarditis, with ventricular dilatation in which universal mechanical venous hyperæmia obtains, with the most urgent pulmonary symptoms. The ascites is scant and developed later than the anasarca, from the first an important symptom.

A 2. In our etiological search, physiological examination of the lungs may be rewarded in finding adequate causal factors, yet here again we must guard against confusion of primary and secondary manifestations. The lungs are often compressed by a large ascites, with evidences thereof in dulness, râles, or even tympanitic resonance, cyanosis, and dyspnoea. To reiterate, such symptoms are purely secondary, and are not *per se* evidences of pulmonary disease. We may remark that the tympanitic pulmonary note of compression may obscure findings otherwise strongly suggestive. In one instance (case of Drew), for illustration, the tympanitic note produced by compression of the lungs by a massive ascites concealed large caseous areas in both the upper lobe apices, which would have otherwise materially strengthened a diagnosis of tubercular peritonitis, by producing apical dulness.

A 3. The liver sustains a peculiar etiological intimacy with ascites, since not only does ascites mask the physical signs of the causal element in the liver, but the retrograde venous stasis is more inevitably expressed in this individual form of passive congestion. In every instance of ascites we strongly suspect the liver when heart and kidneys are negative. The hepatic diseases, in which ascites does not usually occur, are fatty liver, hypertrophic cirrhosis, abscess, the icterus liver, and echinococcus simplex. It does occur in cancer, syphilis, amyloidosis, pylephlebitis adhesiva specifica, echinococcus multiplex, hyperæmia, and cirrhosis atrophica.

Our fifth case illustrates the necessary diagnostic evolution when liver-disease is in question. The patient is a German housewife, of thirty-eight years, who drinks moderately. She has been ill four months with coughing, morning vomiting, pain in and enlargement of the abdomen. On physical examination there is an enormous symmetrical abdominal enlargement, which distends the flanks especially and causes a disproportionate bulging of the lower thoracic aperture. The abdominal veins are prominent. The distention is fluid, since it readily changes with movement of the patient, tympany always remaining above and flatness below. The skin is subicteric. In other words, the examination is wholly negative.

Since the distention does not allow close visceral inspection, we are impelled then to tap the abdomen with several objects in view: (1) to relieve the great dyspnoea; (2) to better examine the intra-abdominal viscera; (3) to determine the nature of the fluid, its percentage of albumin, its specific gravity, its cellular and bacteriological contents. The fluid thus gradually withdrawn by median paracentesis through the linea alba under the most rigid antisepsis is light yellow and has a specific gravity of 1010, which character alone stamps the fluid as a transudate and materially aids the diagnosis. Palpation of the now relaxed abdomen excludes disease in the internal genitalia, to whose important rôle in the causation of ascites we shall again refer. Palpating the upper part of the abdomen, a large, even-edged, firm tumor is felt, the enlarged hypertrophic liver, which has not yet passed into the stage of frank retraction. The spleen is palpable. The transudation character of the fluid, the large, hard liver, splenic tumor, and distended veins are interpreted as cirrhosis, with evidences of venous stasis. The diagnosis of hepatic cirrhosis, apparently most easy, is in reality one of the most intricate. The characters of a portal vein ascites are that it commences in the peritoneum almost invariably, and that the legs swell secondarily from pressure on the inferior vena cava.

This point is a classical criterion, but it is not infallible, since the legs may swell disproportionately, cicatrices or growths may involve the portal vein and cava simultaneously at the notch in its posterior surface, and, finally, the legs may swell first and ascites may remain permanently absent, as in a case observed in the hospital last spring (I. Mylett).

In amyloid liver, ascites results from hydæmia rather than from portal vein obstruction (Bamberger). In abscess it is rare, but may come from sero-fibrinous peritonitis, cachexia, or portal vein compression. In cirrhosis it may be absent from the establishment of an adequate collateral circulation, or death from complications may intervene early before ascites appears. Heart and renal complications may be responsible for ascites in some forms of liver cirrhoses. An attempt should be made to exclude perihepatitis which, according to Fagge, causes one death to every five fatal cases of cirrhosis, and is more apt to be attended by albuminuria. In the liver of passive congestion, ascites appears only after the ankles are swollen, but ascites is prone to occur in cyanotic induration of the liver. In liver syphilis, ascites occurs not alone when the liver is small. It is almost unknown in simple atrophy of the liver. In fifty per cent. of liver carcinomata it occurs from pressure on the portal vein, periphlebitis, a growth of the primary neoplasm into the portal vein from a weak heart, cachexia, or peritonitis, which may be simple, purulent, or carcinomatous, illustrating one phase of the difficulty in the diagnosis of ascites. In pylethrombosis, the ascites develops very rapidly, making tapping necessary, and it recurs rapidly. Urgent diarrhoea and vomiting accompanying it, there are copious hemorrhages from the bowels and stomach, the spleen and abdominal veins are not so large, and the liver atrophies.

B. May the hydrops be due to increased permeability of the blood-vessels? Such effusions are due to exhausting discharges, suppuration, cholera, marantic conditions, infectious diseases, scurvy, and, lastly, Bright's disease. Renal disease produces ascites, which may be difficult to diagnose. Not every instance of albuminuria in ascites is nephritis. Albuminuria in cirrhosis is due to pressure on the renal veins, and disappears after paracentesis, a therapeutic means of diagnosis. Heart and renal disease may produce hydrops peritonei without anasarca, but we must remember that heart, renal, and hepatic disease may be coincident. In renal disease the eyelids often become oedematous first. Cachectic ascites is not uncommon in leukaemia and kindred affections. Slight serous effusions occurring after acute infectious diseases in children may come under this title.

C. Is the ascites due to inflammation of the peritoneum,—*i.e.*, is it an exudate rather than a transudate? A proper etiology, fever and pains, may point to peritonitis. The specific gravity of the aspirated fluid determines whether it is exudative or transudative. A specific gravity of 1014 is the dividing limit. Three classes are distinguished :

1. 1010 specific gravity or lower indicates a cachectic transudate,—*e.g.*, in nephritis, with less than one per cent. of albumin. A very low specific gravity and percentage of albumin occurs in amyloidosis.
2. A hypostatic transudate has a specific gravity between 1010 and 1014.
3. An exudate possesses a specific gravity of more than 1014 and an albumin percentage of more than 2.5 per cent. The lower strata are heavier, and where we must take the specific gravity several times during the paracentesis. When there is a percentage of less than one per cent. no disease of the peritoneum nor portal vein exists. Reuss's formula enables us to compute the albumin percentage from the specific gravity. It is subject to an error of less than one-fourth of one per cent.

The percentage of albumin = $\frac{1}{2}$ (specific gravity —1000) —2.8. A specific gravity of 1017 to 1020 is positively an exudate.

French authors assert the existence of a primary or essential ascites, due to cold, excessive catharsis, drinking freely of water, suppression of menses, checking of hemorrhoidal bleeding. This so-called essential ascites is usually considered as a chronic serous peritonitis or a tubercular peritonitis, especially when it occurs in children. Henoch believes that a chronic serous peritonitis occurs in children, while West and Courtois-Suffit think such affections are tubercular. Henoch admits that the differentiation between chronic and tubercular peritonitis is often very difficult. In tubercular peritonitis there is usually temperature and emaciation, but from the literature can be collected cases in which both are lacking. Bacilli and Koch's reaction may be absent in tubercular peritonitis, while inoculations and cultures are often negative. According to Taprét and Vierordt, chronic non-tubercular peritonitis occurs especially in women, the causes of which, both local and general, concern our subject only in so far as ascites is involved. The general causes are Bright's disease, alcoholism, and heart affections. The ascitic form of non-tubercular peritonitis may pass into the membranous or adhesive variety, the resorption being due to the formation of a collateral circulation in new adhesions, the ultimate stage of which may be peritonitis deformans or pachyperitonitis.

Blood argues for tuberculosis, carcinoma or diathetic diseases, as scurvy.

Serous peritonitis is usually chronic and often idiopathic. It is rare, and is accompanied by some fever, increased pulse-rate, and tenderness. Mechanical or cachectic ascites generally has a cause. It is relatively frequent, and lacks inflammatory insignia, although the two affections may coexist,—e.g., inflammation following paracentesis. Ascites is accompanied by other circulatory disturbances,—e.g., splenic tumor, piles, caput medusæ, etc. The spleen may occasionally be enlarged in tubercular peritonitis or even in simple serous peritonitis. The specific gravity and albumin percentage are almost final in determining between peritonitis and ascites. The fluid is generally clear in ascites, but may be so in peritonitis, in which, however, it is usually cloudy. Alcohol is a cause for chronic serous peritonitis as well as for ascites of cirrhotic origin. The liver is small in the terminal stadium of atrophic cirrhosis, but may be also atrophic in chronic serous peritonitis, according to Frerichs. The vascular dilatation is above the navel in cirrhosis, but is below it in serous peritonitis, as Lancereaux first remarked. In tubercular peritonitis the venous enlargement is disposed as it is in cirrhosis hepatis. Cirrhosis of the liver is signalized by various urinary changes, evidencing incomplete discharge of hepatic functions. There is a sedimentum lateritium, bile pigment, hepatogenous peptonuria, or hepatic glycosuria. In tubercular peritonitis there is an hydrops ascites saccatus, giving an irregular form to the abdomen from meteorism produced by adhesions and irregular nodules simulating carcinoma (as in the case of chylous ascites reported). In children, fluid may accumulate between the layers of the omentum. Hemorrhagic ascitic fluid occurs frequently in tubercular peritonitis, and rarely, if ever, in cirrhotic transudate, unless the latter is complicated with tubercular peritonitis, engrafted as a frequent complication upon the already altered peritoneum as a *locus minoris resistentiae*. In the last-mentioned combination and under other circumstances, free ascitic fluid may exist simultaneously with ensacculated effusions. Intestinal or pulmonary tuberculosis, adhesive pleuritis and meteorism from intestinal adhesions, or an irregular form of the abdomen, with a doughy feel on palpation, speak for tubercular peritonitis. In differentiating between tubercular and carcinomatous peritonitis, the clinical course in neoplasm is relatively more rapid. That paracentesis in carcinomatous peritonitis hastens the fatal issue may, unfortunately, be of diagnostic value.

D. Is the ascites due to local disease of the peritoneum or to

subperitoneal affections other than inflammation? Above other causes, tumors demand early consideration. Miliary tuberculosis of the peritoneum, as distinguished from tubercular peritonitis, may cause a hydrops which is not inflammatory. Carcinosis of the peritoneum causes hemorrhagic or purely serous transudates, demanding distinct differentiation from genuine carcinomatous peritonitis, in which the specific gravity may rise to 1020 or 1022. Literature contains no reference to the clinical separation of carcinosis of the peritoneum and carcinomatous peritonitis. In carcinomatous peritonitis nodules appear, but I have made autopsies upon cases in which tumors in the abdomen did not preclude an ante-mortem diagnosis of tubercular peritonitis, with confirmation post mortem.

Tumors other than peritoneal cause ascites. Uterine fibromata produce hydroperitoneum, which is not usually great, but usually lemon-colored and rarely sanguineous. There is no relation between the size of the tumor and the amount of fluid transuded, since, for example, very small fibromata may excite a considerable effusion. There is, nevertheless, a direct relation between the malignancy of the tumor and the amount of the fluid found (Terillon). According to Pozzi, ascites is rare in ovarian cysts, yet Terrier observed it in thirty-five per cent. of his cases. It is seen mostly in papillomatous cysts, which grow external to the cyst, sometimes with peritoneal metastases. In glandular cysts whose walls rupture by fatty degeneration and pour out their contents into the abdominal cavity, serum is secreted by the peritoneal surface because of the irritation, even though the ruptured cyst be very small (Quénau). The fluid contained in cysts contains more solids (60 to 70 grammes pro mille) than does the ascites,—e.g., of renal disease (25 grammes) (Méhu). Championnière never saw an ovarian cyst complicated with ascites recover, although Pozzi writes that his experience must be regarded as exceptional.

In conclusion, a recapitulation of our subject is proper; less for the actual concrete material which constitutes the clinical history, symptoms, and findings of the cases presented; less for the minutiae relative to the various diseases considered; less, in short, for the individual facts than for the broad, rational, progressive, and diagnostic methods which insure certain and direct therapeutic results.

1. Given an instance of abdominal tumor in the broadest sense of that word, is it gas, fluid, or solid?

2. What causes may simulate ascites, provided prominent clinical characters point to fluid, solid, or gaseous tumor?

3. If the fluid is intraperitoneal, is it free, movable, or both?

4. May anomalous symptoms and signs be explained by exceptions recognized as occurring in ascites?
5. Granting the existence of ascites, what is its etiology viewed in the light of searching physical exploration of the various viscera?
6. Is it an essential, primary, or idiopathic ascites?
7. Can mechanical vascular stasis, (a) extraperitoneally, (b) intra-peritoneally located, account for the effusion?
8. May cachexia, weakening the vessel walls, be the cause?
9. Is there peritoneal inflammation, primary or secondary?
10. May some local peritoneal or subperitoneal disease irritate the peritoneum?
11. Is the finally determined cause a final, ultimate cause, or is it itself secondary?

CANCER OF THE STOMACH.

BY ROBERT SAUNDEBY, M.D. (EDIN.), F.R.C.P. (LOND.),
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Birmingham.

FOUR years ago I published a lecture on the diagnosis of cancer of the pylorus, illustrated by two cases, which showed that in the absence of a palpable tumor it is impossible to diagnose with accuracy the presence of cancer of the stomach, although, no doubt, we may often suspect its occurrence, and not infrequently find our suspicions well founded. I have recently had under my care a case sent in as cancer of the cardiac end of the stomach, which presented features of some practical interest from the same stand-point of diagnosis, and may serve as a means for introducing a few remarks based on the experience of the past few years in the diagnosis of diseases of the stomach.

Robert S., aged sixty-three, a laborer, was admitted into the General Hospital on June 11, 1896, complaining of pain, after food, in the upper part of the belly, vomiting, and inability to swallow.

He had been ill six months, but before that time had been very well ; he began by being troubled with flatulence after food, and in a short time this was followed by vomiting, which at first occurred after his breakfast, but lately after every meal at which he has taken solid food. Solid food seemed to stick about the level of the xiphoid cartilage, causing pain and oppression, which were relieved by the vomiting that quickly followed these symptoms. Liquids caused neither pain nor vomiting. He had lost upward of four stones (fifty-six pounds) in weight, having been thirteen stones seven pounds in March, and eight stones thirteen pounds on admission. He had never vomited any blood.

His family history was singularly good ; his father and mother having died at seventy-four and eighty-two, respectively, while eleven brothers and a sister were all alive and in good health.

His work had been chiefly out of doors as a navvy or builders'

laborer ; he had taken a good deal of beer, but was not intemperate ; his wife died in October last, and he had felt her loss very much.

He was a very emaciated man of large and well-developed frame ; there was no jaundice, oedema, or cyanosis ; temperature 97° F., respiration 20, pulse 72. His teeth were fairly preserved ; tongue dry and furred ; appetite poor ; bowels fairly regular ; liver and spleen not enlarged ; some slight tenderness in epigastrium ; no tumor to be felt ; a large-sized bougie could be passed quite easily into the stomach, but some difficulty was experienced in introducing a soft stomach-tube ; the air-distended stomach did not transcend the normal limits, and the fasting stomach contents consisted of epithelial cells and leucocytes without any starch granules, proving that the stomach emptied itself, as he had taken a pint of bread and milk for his supper. A test-breakfast of tea and bread showed, on removal, an absence of free hydrochloric acid, and the presence of a large quantity of lactic acid ; peptone was absent, but albumose and sugar were present. Artificial digestion experiments with the filtered contents showed that pepsin was deficient as well as hydrochloric acid.

The heart's impulse was feeble, and the first sound at the apex was sometimes replaced by a murmur, but in other respects the chest presented nothing abnormal. He was ordered one ounce of milk every hour, and pulv. sodii sulph. efferv. (B. P.), 3*i*, *capiat ter die ex aqua calida*.

Two days after admission his temperature rose to 101.5° F., and continued to rise to nearly the same level every evening for six days, when it fell and only surpassed 100° F. once afterwards.

On the 16th, as he complained of being tired of milk, he was put on milk, minced mutton, and Hamburg rusks, and ordered the following mixture before meals.

B Bismuthi carb., gr. xv;
Sodii bicarb., gr. xv;
Mist. tragacanthi, 3*i*;
Aq. menthae pip. destil., ad 3*i*.
Fiat mistura, mitte 3*viii*.

Sig.—*Capiat cochlearia magna dua ante cibos ter in die.*

The sulphate of sodium was continued before breakfast only.

He gained three pounds in weight in the first week, and managed the diet described above pretty well, but as there was some complaint of pain his stomach was washed out again on the 20th, and on this occasion some blood was mixed with the water when it was withdrawn.

The stomach contained undigested pieces of meat, which had been imperfectly minced.

On the 24th minced chicken was substituted for minced mutton, and on the 28th he was allowed an egg beaten up or lightly cooked. By that time he had gained seven pounds in all since admission.

July 1.—The fasting stomach contained a considerable quantity of mucus, a number of epithelial cells, and starch granules; no sarcinae.

On July 4 he was weighed for the last time, and his weight is recorded as nine stones seven pounds (one hundred and thirty-three pounds), a total gain of eight pounds in three weeks. The following day he complained of continuous pain, and on the 6th this was so evidently severe that he was ordered morphine, one-sixth of a grain, *sub acute*, to be repeated when necessary, and his diet was altered to milk and barley-water. He vomited, and the ejected matter contained a little slightly altered blood. On July 7 he vomited a large quantity of blood and died shortly after.

At the post-mortem examination the stomach was found to be adherent to the liver and pancreas; on being opened it contained a large amount of dark grumous clotted blood; when this was cleared away an extensive fungating and ulcerated cancerous growth was seen occupying nearly one-third of the length of the stomach, situated near the pylorus and towards the lesser curvature. Perforation of the stomach had evidently occurred where it was adherent to the liver, but the latter was not invaded by the growth. The pancreas was adherent, and the seat of dense secondary deposits. The liver and kidneys were fatty, and the heart's muscle was soft and flabby.

As already stated, this case was sent in as one of cancer of the stomach, and the disease was supposed to be situated at the cardiac opening on account of the dysphagia; but the disappearance of the latter symptom and the absence of tumor, of pain, of coffee-grounds vomiting, and the gain in weight threw doubt upon the suggested diagnosis. The alternative was chronic gastritis with atrophy of the gastric mucous membrane, which would explain most of the symptoms; but against this were the sudden onset, the great and rapid loss of flesh and strength, and the absence of any cause, such as an acute infectious process, which might have set up atrophic gastritis. I had, therefore, to accept the diagnosis of cancer of the stomach as on the whole the more probable, although many of its essential elements were wanting.

On his admission the patient complained of difficulty of swallowing, and our house physician, Dr. Steed, although very experienced and skilful in this manipulation, at first failed to introduce the stomach-tube. After I had passed a large oesophageal sound we heard no more of the dysphagia, and the tube went in pretty easily, so that any difficulty must have been due to spasmodic contraction of the oesophagus, a common cause of dysphagia and one usually removed by the passage of a full-sized sound. As the operation was unattended by the slightest pain or hemorrhage, it became impossible to maintain the opinion that there was a cancerous growth at the cardiac opening, and for the moment the diagnosis of cancer of the stomach seemed to be deprived of its principal foundation.

There is no evidence whatever of cancer heredity, and as is so commonly the case in cancer of the stomach the disease appears to have set in without any previous stomach symptoms, in fact, without any preceding derangement of health whatever. There is nothing in the history which throws any light on the condition, unless we regard his occupation as affording some sort of explanation in the light of the modern suggestion that cancer is caused by an amoeboid organism living in damp soil. The man seems to have been principally engaged in excavating, but he had lived and worked for some years in Birmingham and the immediate neighborhood, where there is little alluvial land, and cancer of the stomach is unquestionably a rare disease.

Among the minor signs to which I am in the habit of attributing some significance there is none more full of sinister meaning than absolute loss of appetite and indifference to food. This was not present here; on the contrary, he asked for and obtained a more varied diet, and although he complained of minced mutton he took minced chicken and asked to be allowed to have an egg only two or three days before his death.

He was constipated, but by no means obstinately, the effervescent sulphate of soda acting well in the small dose prescribed. The association of somewhat peculiar dry faeces leading to a confined state of the bowels, requiring the most drastic purgatives to overcome it, has been often noticed in cancer of the stomach, but here there was no more than is generally seen in patients who have to lie in bed.

There was no jaundice, nor any peculiarity about the color of his skin. He had been a dark man, well-tanned by the sun, and the disappearance of this with the anaemia incident to his dyspepsia accounted for the pallor of his face. The so-called cancerous *facies*

is of no real value as an aid to diagnosis, as it may be absent in true cancer and present apart from it. No pallor or cachexia can be greater than we see in atrophic gastritis in its more severe form.

Trousseau laid stress upon the occurrence of *phlegmasia alba dolens* in one leg as a sign of cancer of the stomach, but there was no trace of oedema in either leg. I do not think general experience has confirmed Trousseau's opinion as to the frequency of this association. His tongue was dry and furred, but there was not the marked foulness which some authors regard as so specially characteristic of cancer.

The pain as described in the history was peculiar; that of cancer is generally persistent and severe, but this was only caused by solid food, and was relieved at once by vomiting, which is more like that complained of in gastralgia or simple ulcer; moreover, after his admission until two or three days before his death, the pain did not trouble him, and he was able to take solid food in reasonable amount without the recurrence of either pain or vomiting. When the pain returned he described it as a fixed pain in his back, and certainly at that time he conveyed to me the idea of such pain as might be caused by an aneurism or a growth involving the spinal column. The presence of an aneurism of the abdominal aorta just below the diaphragm did pass through my mind as a possible explanation of the symptoms.

There had been no coffee-grounds vomiting, and no blood was seen until just before his death, except on one occasion after washing out his stomach. It is not very unusual to meet with this accident under such circumstances, even where no ulcer or cancer is present; and though in the present case, cancer having been suspected, we became more cautious in the use of the stomach-tube, the hemorrhage could not be regarded as decisive of the diagnosis. When I saw the large fungating surface, *post mortem*, I could not help feeling surprised that there had been so little bleeding, and that the tube had been introduced so many times without causing it, but the obvious explanation is that the tube as a rule did not penetrate beyond the cardiac end of the greater curvature.

The position of the tumor and the adhesion between the stomach and the liver accounted quite sufficiently for our inability to feel it by palpation during life, even when the stomach was fully distended with air. In the absence of a palpable tumor the diagnosis of cancer must always be doubtful, and here we had other symptoms wanting, which might have helped us to a definite conclusion.

The *fever* that occurred after his admission is not uncommon in

cancer of the stomach, and cases have been recorded in which it assumes an intermittent type with rigors (Ewald), without any pus-formation, but such moderate fever as was present here is often seen in chronic gastritis, and could not throw any light upon the question of diagnosis.

The most unexplained feature was the steady and considerable gain in weight, which amounted to eight pounds in a month. This was not due to any dropsical accumulation, as the body was quite free from anything of the kind, except a little trace of fluid in the pericardial sac. Although such an increase in weight is very exceptional, we must accept this case as evidence that it may occur even when pronounced cancer is present. Rousseau has recorded several cases of cancer of the stomach lasting over several years, with intervals of comparative well-being, and these remissions must be familiar to many practitioners; it is possible that our patient might have lived some time longer but for the profuse hemorrhage which carried him off.

During the last few years I have been investigating with great care all stomach cases in my wards and have paid especial attention to the question of dilatation. It is generally easy by inflating the stomach with air to determine its size, but I have found that it is extremely common to meet with relaxed stomachs, which on distention occupy much more than the normal anatomical area, but these are not dilated stomachs in the ordinary sense. A dilated stomach is one which has lost the power of contracting so as to empty itself completely. This defect can be determined by giving the patient a pint of bread and milk at 9 P.M., and washing out the stomach at 9 A.M. A fairly healthy stomach should be quite empty of food, and this is what we find to be the case in these merely relaxed stomachs; true dilatation is rare.

Careful microscopical examination of the contents of the fasting stomach failed to detect anything more than the evidence of gastritis,—e.g., mucus, leucocytes. There were no suspicious cells, no fragments of a growth, no blood-corpuscles, no sarcinæ, and no food except on the occasion when the large unminced pieces of meat were washed out.

Professor Moritz has shown that in health the pylorus only permits the passage of very small fragments of solid food, and that larger pieces are returned to the stomach for digestion, so that, as in this case peptic digestion was absent and the solution of meat by the gastric juice impossible, it was only natural that such lumps caused pain and distress.

The *post-mortem* examination showed that the growth only reached the pyloric opening at one part, and therefore probably caused no obstruction, but it must have hindered the active contraction of the pyloric portion, which we believe plays such an important part in emptying the stomach, although clearly the hinderance was not enough to prevent the passage of finely-divided solid food.

There was no free hydrochloric acid, but this sign of cancer has been abundantly discounted, and has no value for diagnosis. Pepsin was also absent, a much rarer occurrence, but, unfortunately, like the former, dependent upon atrophy of the gastric mucous membrane, and not related to the presence or absence of cancer.

In fine, there was no family history of cancer, no obstruction to the cardiac orifice or epigastric tumor, no complete loss of appetite or obstinate constipation, no jaundice or marked cachexia, no oedema or phlegmasia alba dolens, no pain (after admission) until a few days before death, no coffee-grounds vomiting or haematemesis until the final fatal attack, no cancer-cells or other microscopical evidence of malignant disease in the fasting stomach contents.

On the other hand, there had been great loss of weight with constant pain and vomiting after food, although all these ceased under the influence of treatment, and there was no peptic digestion. Strongly in favor of the diagnosis of cancer were the age of the patient, the comparative suddenness of the onset of the symptoms, without previous ill health and the great loss of flesh in a few months. These were enough to justify a very cautious prognosis, and to form the basis for a probable opinion, but they could not enable any one to make a positive diagnosis.

FOOD-POISONING.

CLINICAL LECTURE DELIVERED AT UNIVERSITY COLLEGE, LONDON.

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GENTLEMEN,—In commencing these lectures on toxicology I told you that it would be necessary to impose some arbitrary limits on the range of subjects to be treated, and accordingly that we should not deal with those poisons which are the products of living microbes, and which more properly come within the domain of the pathologist. Food-poisoning, however, stands upon the border-land of toxicology and pathology. Food-poisoning is often so sudden in its onset and so rapid in its progress as to give rise to suspicions of foul play, and on that account comes within the range of the medical jurist,—albeit that the *vera causa* of the trouble is in many cases not to be distinguished from that which gives rise to a true infective fever. One of the best-known forms of food-poisoning is *sausage-poisoning*, which has been studied in Germany, and has been called botulismus. Let us clear the way by stating that the form of “sausage-poisoning,” of which I am about to speak, does not include infection with parasites, such as *trichinæ* or *tæniæ*, and you will soon perceive that it is something far more serious than an ordinary attack of gastritis from indigestible food. Most of the cases which have been described occurred in the Würtemberg Black Forest, where the incidence of the disease has often resembled that of a limited epidemic attacking whole families or small communities. Up to 1853, four hundred cases had been published, of which one hundred and fifty had been fatal. The sausages which have produced these troubles are of the kind often spoken of in this country as “German sausages,”—that is, sausages which are of large dimensions, and which are “smoked” and not cooked.

In the Würtemberg Black Forest it is customary to make such sausages of pig's meat, and to “cure” them by smoking them in the

chimney over a wood fire. It is stated that the sausages which have given rise to poisoning have been made and cured carelessly and in such a way as to encourage putrefactive changes. The danger is said to be greatest when the sausages are too moist and watery in consistency, due to the composition of the sausage or the unsteady drying of it when made. Accordingly, we find that sausages made with liver, brains, or blood, or to which milk has been added have been particularly blamed; also that very big sausages have proved dangerous because of the difficulty of drying them in the middle. Further, it is stated that sometimes the accident has arisen because the drying and smoking have not been properly carried out. If the fire go out and the sausages are allowed to freeze in the chimney and to thaw again, it is said that putrefactive changes are very liable to occur.

Let me remind you that "sausage-poisoning" was well recognized before the knowledge, which we now have, of putrefactive and other organisms and their mode of cultivation was current. We now know that for a large number of these organisms fluid media are necessary for their cultivation or media in which the proportion of water is relatively large. They flourish in sewage water, in hay-infusions, in the discharge from wounds, and in milk, and the media which are used for their cultivation in bacteriological laboratories consist of sterilized broths or broths mixed with just sufficient gelatin or agar-agar to make them firm at ordinary temperatures. "German sausages," to be safe, must be continuously *dried* in antiseptic smoke, and the conditions in which sausages, which have proved dangerous, have been found, are precisely those in which the growth of putrefactive and pathogenic organisms are likely to occur.

Some of the sausages when cut across have been evidently permeated with fungoid growths, and a micrococcus, called "sarcina botulina," was many years ago discovered in them. It is noteworthy that in these cases of sausage-poisoning an incubative period, ranging from eighteen to twenty-four hours, has generally been described, and it is said that the fatal cases have terminated, as a rule, in five or six days. In addition to more or less gastro-intestinal irritation those attacked have suffered from extreme muscular weakness, sore throat, and dysphagia, and various nervous symptoms, such as squint, ptosis, loss of visual accommodation, stupor, and convulsions. The immediate cause of death in most cases has been a gradual failure of the heart.

It is impossible not to be struck with the similarity of these nervous and cardiac troubles with those which so often supervene as a sequela of diphtheria. In diphtheria these nervous symptoms are due

to nerve degenerations brought about, according to Dr. Martin, by an acid and an albumose, which are formed as a consequence of the cultivation of the bacillus diphtheriae on the palate, fauces, or elsewhere. In sausage-poisoning the cause of the phenomena is strictly analogous, the only difference being that the toxic bodies are brewed outside the body, and not in it.

Sausage-poisoning is not common in England, because our habits do not lend themselves to this particular form of food-poisoning, but outbreaks of a disease of a distinctly analogous kind have been observed again and again. Many of these outbreaks have been observed and recorded by Dr. Edward Ballard, F.R.S., one of the most distinguished of the Alumni of University College, to whom the public is indebted for many important discoveries in connection with public health. In all the cases observed, the phenomena were those of gastro-intestinal irritation, with febrile and nervous symptoms, such as accompany infective fevers and were preceded by an incubative period. In 1880, at Welbeck, nearly one hundred persons suffered, and four died from eating cold hams which had been stored in a dirty place for the four days preceding. In 1881, at Nottingham, several families were attacked after eating "cold gravy," which was made from "stock" which had been kept in a filthy cellar. At Chester "tinned sausage" has proved fatal, and at Oldham "tinned" pigs' tongues produced serious illness in several persons. At Bishops Stortford three families were made ill from eating cold ribs of beef, and at Whitchurch (Salops) cold brawn and cold roast pork on two separate occasions produced similar results. At Wolverhampton, in 1884, a "blown tin" of salmon not only proved fatal to two persons, but was found to be most fatal to animals inoculated with it. In 1886, twenty out of twenty-four persons who partook of a wedding breakfast at Carlisle were attacked. The breakfast was cold, and consisted largely of gelatinous dishes, such as jelly and game-pie, which had been stored in an ill-ventilated cellar. Twelve persons suffered at Iron Bridge from eating veal pie "warmed up" on the second day, and at Retford eighty persons in twenty-two families were made ill from eating pork-pie and brawn. At Carlisle, pork and brawn produced similar results in 1889, and at Portsmouth cold pies proved harmful to nine boys and four adults. Finally, Dr. Ballard seems to have shown that at Middlesborough, in 1888, an epidemic of pneumonia was largely due to the consumption of half-cooked "American bacon," which had been hastily and improperly cured in this country in a factory built over a sewer grating.

In all these cases of Ballard's micro-organisms were found in the

food and in the bodies of animals fed or inoculated with the food, and the poisonings were doubtless caused by the ingestion of the bacilli themselves or of the chemical products formed by them. The presence or absence of a well-marked incubative period appears to depend upon whether the product of the organism is present in the food in toxic quantities (in which case the incubative period is absent or very short) or whether the bacillus alone is taken and the poison is brewed by it in the body of the infected person.

Ballard points out that in the fourteen instances which he brings together pig-meat was the cause of the food-poisoning in nine of them, and the explanation is probably to be found in the fact that not only is pork often eaten cold, but its gelatinous nature lends itself to the cultivation of microbes. Finally, in studying the etiology of food-poisoning, and after arriving at the conclusion that it is due to the fact that the food has accidentally become a medium for the cultivation of pathogenic microbes, we have to inquire how such so-called accidents arise. It will be observed that food-poisoning has most often arisen in connection with food which has been stored after cooking, and has been eaten cold after an interval of one or more days, and Dr. Ballard was able to show that in all but one of the cases he reported the food had been stored in a foul place.

An interesting case in which the same class of facts was observed was lately brought to my notice by Mr. T. Bullock, of Isleworth. A family bought a leg of pork, and ate it hot on Sunday. None of those who shared this Sunday dinner were made ill, but of those who partook of the cold remains on Tuesday, three or four suffered severely from gastro-enteritis. What still remained was given away, and of the three who ate it all were dangerously ill, and two died on the following Sunday. When the facts came to be investigated, it was found that the meat after cooking had been stored in a filthy larder under the stairs, communicating, on the one hand, by means of a "ventilator," with a dog-kennel, which had "never" been cleaned, and, on the other, by means of the stairs with the damp basement of an ill-drained house. In the Middlesborough epidemic it was found that the bacon fat which was removed from the sewer grating was singularly fatal to the animals to which it was given.

It is well known that mussels and other forms of "shell-fish" are liable under certain circumstances to produce gastro-enteritis of a violent kind, and recent facts seem to show that an important factor in the causation of limited epidemics of "mussel-poisoning" is the water in which the mussels have grown and been nourished, and in

not a few instances poisonous mussels have grown in harbors, and similar foul places into which sewage has been allowed to flow, and in which there has been more or less stagnation. Not only mussels, but other "shell-fish," such as crabs and lobsters, and certain other kinds of fish, such as mackerel, have an evil reputation for being occasionally dangerously unwholesome. It must be remembered, however, that fish of all kinds is very prone to undergo putrefactive changes, and that any evil qualities which it may acquire are not necessarily due to its mode of nourishment, but to its being stored in unwholesome places on land. The cause of these epidemics is alleged to be the formation of alkaloidal bodies having poisonous properties, and which have received various names according to their source of origin.

It appears, however, to have been recently established that certain "shell-fish" which are habitually eaten raw may become the vehicle for the conveyance of the germs of specific disease, such as cholera and enteric fever. This fact appears to have been first pointed out by Johnson Lavis and other practitioners at Naples, where the oysters nourished in the then filthy little harbor of Santa Lucia were frequently the means of conveying the infective poisons of enteric fever and cholera to the consumers of them. In 1893 there were in this country a few cases of cholera, which were investigated by the Local Government Board, and in not a few instances the infection appears to have been traced to oysters grown in "beds" situated at Grimsby and Cleethorpes; the official report on the subject concludes with the following words :

"One thing is certain, oysters and shell-fish, both at the mouth of the Humber and at other points along the English coast-line, are at times so grown and stored that they must of necessity be periodically bathed in sewage more or less dilute; oysters have more than once appeared to serve as the medium for communicating disease, such as enteric fever, to man; and so long as conditions exist, such as those with which the oyster trade of Cleethorpes and Grimsby is shown to be associated, conditions which may at any time involve the risk of the fouling of such shell-fish with the excreta of persons suffering from diseases of the type of cholera and enteric fever, so long will it be impossible to assert that their use as an article of diet is not concerned in the production of diseases of the class in question."

It will be remembered that in 1895 several cases of enteric fever in this country were traced to the consumption of oysters.

These food-poisonings may be arranged in three classes :

1. Cases in which a diseased state of the animal consumed as food has been the means of causing disease of a similar kind in the consumers. The cases reported in Germany in which gastro-enteritis closely resembling typhoid has followed the consumption of diseased veal belong to this category.

2. Cases in which the food, without being in itself unwholesome, is made the vehicle for conveying pathogenic microbes to the consumer,—most of the “milk epidemics” of enteric or scarlatina and mollusk enteric and cholera belong to this class, but it must be remembered that classes one and two are not always to be easily distinguished.

3. Cases in which food which was wholesome when bought and wholesome when cooked has become infective from being kept in a filthy place. The cases described by Ballard mainly belong to this category, which seems to cover the majority of the cases of food-poisoning.

What has been said with regard to these cases must impress us with the strong analogy existing between many cases of food-poisoning and the specific infective processes which are met with in the various fevers.

The pathology of fever which is now generally accepted is that the body is invaded by microbes which growing, brew “toxines” from the blood and tissues, and that these toxines, after absorption, cause the various phenomena of the fever.

Food-poisonings are distinctly analogous. The food may contain microbes which, taken into the body, tardily brew a “toxine” which thus produces its effect after a relatively long incubative period; or the toxine may have been previously brewed in the food in large quantities, and then the toxic effects closely follow the ingestion of the meal.

In the former case where the attack is slow and insidious, it may be impossible to connect the symptoms with any particular article of diet, but in the latter case the connection between the food and symptoms is obvious. It is clear that the investigation of cases of infective fever and pneumonia cannot now be considered complete without careful inquiry into the food consumed by the various persons attacked.

The chemical nature of the bodies which are the actual cause of the poisonous effect occasionally produced by food has received considerable attention from chemists.

Many of the bodies formed during putrefaction appear to resemble alkaloids in their general chemical reactions, and Selmi, who was one of the early investigators of these bodies, proposed for them the name

of ptomaines or cadaveric alkaloids. Selmi derived his word from *πτωμα*, a corpse, and it has been not unusual to speak of food-poisoning as "ptomaine"-poisoning. It would seem that the time has come for abandoning this barbarous and unpronounceable word, for not only are poisonous bodies found in other things than corpses, but it is certain that not all the poisonous bodies which result from putrefaction resemble alkaloids. Further, we now know that although found in corpses these bodies are the products of the active life of micro-organisms. It seems better, therefore, in every way, to speak of them as food toxines or putrefaction toxines, and in so doing we call attention to the analogies which exist between food-poisoning and the other infective processes.

For this view I am happy to find that I am able to quote the authority of Dr. Kanthack, who, in his article on the "Pathology of Infection" in Allbutt's "System of Medicine" (vol. i. p. 527), says, speaking of the uncertainty which still overhangs the chemistry of bacterial products,—

"In the mean time we may sum up that among the specific toxines there have been found

"(a) Ptomaines.

"(b) Toxic proteins, toxalbumins.

"(c) Nucleo-albumins and albuminoid substances.

"(d) Ferment-like bodies (enzymes) secreted by the bacterial cell; and, knowing as little as we do, it is safest to apply to the bacterial poisons the general term toxines."

It is well to bear in mind that these "toxines" may be derived from vegetable bodies (such as ergot of rye and mouldy maize, which have in times past produced epidemics of ergotism and pellagra), and that in all probability they may be volatile and assume a gaseous form. Thus Dixon Mann, in a paper on "Ptomaines," published in the *Medical Chronicle* in 1888, says, "The peculiar effects—drowsiness, mental depression, and lassitude—which I experienced in the early stage of the operations, when working at the isolation of pathogenic ptomaines from the organs of patients who had died from infective diseases, incline me to believe that some of these products are volatile."

Hünefeld found that tissues impregnated with arsenic and allowed to decompose gave off an odor of garlic, and that the arsenic tended to disappear entirely, and Victor Vaughan also found that at the end of six months he could get no evidence of arsenic from chopped liver which had been kept in a bottle, and which had previously yielded unmistakable evidence of arsenic.

Among the common products of the putrefaction of organic matters are gases such as carbonic acid, hydrogen, marsh gas, and sulphuretted hydrogen, and we know that the latter produces poisonous effects even in small quantities, and, according to Haldane, is the probable cause of the death of sewer-men who enter unventilated sewers, and must be regarded as a gaseous toxine resulting from the putrefaction of food-refuse, such as the contents of kitchen-sinks and the abominations known as "fat-traps." The fact that gaseous toxines undoubtedly exist is one which must not be lost sight of, and is of great practical importance.

It must be borne in mind that food which has become toxic is not necessarily in a repellent condition, and in some instances it has been observed that the toxic qualities of food have lessened when the grosser and more repellent forms of putrefaction have set in. Many persons habitually eat "game" in a condition which to many of us is sickening and repellent, and others highly appreciate the flavor and odor of "ripe" cheese,—*i.e.*, cheese which is riddled with moulds of various kinds.

It has been stated that the toxines which are the result of anaërobic microbes are especially dangerous, but of this further evidence is necessary. It is the anaërobic fermentation, such as putrefaction under water, which especially gives rise to foul-smelling bodies, but, as has been said, the toxicity of such bodies differs immensely. We are in want of exact information on the whole subject, and doubtless such information will in the course of time be gradually furnished.

The *treatment* of food-poisoning need not detain us, as it has to be conducted on ordinary medical principles, and must necessarily vary with the time which has elapsed between the ingestion of the poison and the commencement of treatment. It must be both eliminative and restorative, but must vary with the symptoms. A certain number of cases end fatally in spite of treatment, just as is the case in the other infective diseases.

It is far more important to consider the measures which must be taken to prevent the occurrence of food-poisoning.

A large proportion of cases have occurred in food eaten raw, and there can be no doubt that the *thorough cooking* of the food, by killing the micro-organisms upon which the toxic changes depend, would tend in many instances to prevent the occurrence of the mishaps we have been considering or to lessen the severity of the symptoms.

If the toxines be already formed in large quantities, the effect of heat is not always to destroy their toxicity. Some toxines, such as

cobra-poison, are said to be very tolerant of high temperatures, and it is certain that food-poisoning has occasionally followed the ingestion of well-cooked food, showing that the food toxines are also occasionally tolerant of heat.

In food which is stored after being cooked it is very important to prevent the growth of micro-organisms, or, in other words, to keep it sterile.

I remember once ordering a quart of turtle-soup to be sent to an invalid in the country, and I asked the tradesman who supplied it how it was to be kept from "going bad," as it was probable that the quantity supplied would be enough for four or five days. His answer was that, if it was just raised to a boiling point every day, it would keep as long as one chose. This answer was exactly what would have been given by a bacteriologist, and it is noteworthy that many of the sterilizing and antiseptic processes which are so frequently employed by scientists and surgeons have been practised by well-trained cooks for centuries. Practice and "rule of thumb" is often perfectly sound, although we may be ignorant of the *rationale* of the process.

In every well-conducted kitchen a "stock-pot" (i.e., a pot in which bones and meat are boiled) is kept going for the furnishing of a foundation for soups and gravies, and if its contents are raised to the boiling point every day, they will keep continuously wholesome. If, however, the stock-pot be neglected, its gelatinous contents are very liable to serve as a cultivating medium for pathogenic microbes. It will be remembered that in more than one of Dr. Ballard's cases of food-poisoning it was the cold gravy which proved to be the toxic material.

It is not likely that we shall abandon the use of cold food, which is both convenient and agreeable, and the danger of eating cold food is not great, if certain precautions be taken.

The place where cooked and uncooked food is stored—the larder—must be wholesome, and to this end some care must be used in its construction. The following appear to me to be the points which demand attention in the larder, an apartment which may influence the health of a household to a very great extent.

1. The larder must be *dry*. Both walls and floor should be above suspicion as to dampness. Any mould or mildew growing on the floor or walls is very apt to infect the food. The floor should be of concrete, without seams or joints. The walls should be whitewashed every year, and the shelves (if expense be no object) should be of some non-absorbent material, such as marble, slate, glazed earthenware, or glass.

It is better to have a larder above the ground level than below it, because in the latter situation it is very difficult to prevent dampness.

2. A larder must be *cool*. If it have no rooms above it the roof must be so constructed as to keep out the heat of the sun. It is essential that its windows and ventilator should face the north. The temperature which is most favorable for the growth of microbes is one which approaches the blood-heat, and, speaking generally, one may say that the higher the temperature the more likely is the "cultivation" of microbes to go forward. It is important that neither the flue of the kitchen fire nor that of any other fire should touch the wall of the larder.

3. Good ventilation is essential. The windows should be big, and should be protected on the outside with wire gauze, so as to prevent the access of flies or other insects.

4. On no account must there be a pipe communicating with any underground drain or sewer either inside or, indeed, near to any place where food is stored. The Middlesborough case shows the possibility of food being contaminated by emanations from a sewer, and also the possibility of epidemic pneumonia resulting therefrom. In short, we must bear in mind that sewer-poisoning may be indirect through the food as well as direct from the sewer itself. When the shelves and floor of a larder are washed they should be wiped dry, and such washing should be carried out preferably in dry weather, so that the drying process may be complete.

We also know how sensitive food is to unwholesome contaminations, and we may well have a doubt as to the sanitary condition of show dairies where a cool splashing fountain plays in the centre, because such a fountain must cause dampness and have a waste-pipe, and we must fear that such a waste-pipe communicates with a drain. A dairy equally with a larder should be kept cool and dry and offer no facilities for the ingress of putrefactive products from a sewer.

I would point out that it is not any protection to have pipes trapped, because in every form of trap one must have stagnation and wherever stagnation occurs there must be putrefaction. A very small quantity of food-refuse or milk is enough to set up putrefaction in a trap. If any outlet for water is thought desirable in a larder it should be in the form of an open gutter, which can be thoroughly cleaned and dried, and which should pass directly through the wall on the floor level, the opening in the wall to be closed by a sliding trap-door when the gutter is not being used. No bacteriologist needs to be reminded that a water-trap is necessarily a cultivating chamber.

The fact, now only too well established, that food or water or milk may convey pathogenic microbes to the consumer has led to the advice that all food, milk, water, meat, oysters, etc., should be cooked thoroughly before being consumed, and if this be done, it is thought that we shall get no harm from mixing our fæces with our victuals as we are now practically compelled to do by act of Parliament.

It is, however, more than doubtful whether we can altogether do without some forms of raw food. Certain it is that our natural appetites impel us to the consumption of many forms of raw food, and that we, most of us, enjoy new milk, raw oysters, salads, and fermented drinks, which are all in a sense "alive." Certain it is that nature intended sucklings to live on raw milk, and we must have misgivings as to the advisability of disallowing this natural nutriment. Our numerous experiments with animal extracts seem to enforce the conclusion that cooked food may be very different in its physiological effect from raw food. The marvellous results which follow upon the administration of thyroid extract prepared by evaporation under a vacuum or by extraction with glycerin are not observed when the cooked gland is given. Most of us also have had experience of the great value of uncooked meat-juice, and it is not improbable that the high value of cod-liver oil is due to the fact that it is extracted at a temperature under 180° F.

It is possible that our knowledge on these questions will be more certain at no distant date, but the considerations I have brought forward make it certain that we must pause before we throw over articles of diet which have been used for centuries by the human race.

NERVOUS DYSPEPSIA AND ITS TREATMENT.

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THE term "nervous dyspepsia" is best limited to those cases of indigestion of food in which there is a great prominence of symptoms referable to the nervous system. Nervous symptoms are present in the majority of cases of dyspepsia, but the term "nervous dyspepsia" is best limited to those cases in which there is great excitability of the nervous system, which is acted on by the indigestion of the food and which reacts itself on the process of digestion. Elsewhere I have spoken of nervous dyspepsia as a gastric irritation with a prominence of nervous symptoms,—that is, nervous symptoms with irritation of the stomach present during the digestion of food. Gastric irritation in ordinary cases of indigestion of food is produced by the abuse of food and food accessories. In nervous dyspepsia this may also be the starting point of the condition, but the presence of food in the stomach produces not only pronounced local symptoms, but also exaggerated reflex effects. These results may ensue from the presence of very little food which may be of a non-irritating character. In other cases again the symptoms are associated with so-called emptiness of the stomach and are relieved by food, but in the majority of these instances the stomach is not empty ; it contains a small quantity of irritating acid liquid.

The effect of the nervous system on the normal processes of digestion is not very definitely known, either as regards its effect on the secretion of the gastric juice or on the motions of the stomach. What is known is that through the vagus nerve the stomach is connected with the central nervous system by both afferent and efferent fibres, but that there is no direct nervous control of the secretion of the gastric juice, although the effect on the muscles of the stomach is more direct. In pathological conditions, however, the effect of the central nervous system on the processes of the stomach is more evident ; so

that, not only does the condition of mind tend to produce symptoms of indigestion of food in the stomach, but the condition of the stomach itself leads to exaggerated reflex effects, which are expressed as subjective nervous sensations.

The classes of individuals in which nervous dyspepsia occurs are both rich and poor. It is more common in women and especially those who lead objectless lives, who have an excitable nervous system, and in whom neuralgia is a frequent symptom, as well as painful menstruation. It is not infrequently seen also during lactation, and at the menopause not infrequently severe nervous dyspepsia is developed. Among men, on the other hand, it is found in those who lead sedentary lives, skilled workmen or foremen with responsible positions, as well as lawyers and doctors.

In both sexes the condition is frequently inherited, either from the father or the mother or the grandparents. The indigestion itself may not be inherited, only the nervous disposition, which shows itself in a variety of ways.

Of the more important immediate causes of the condition may be mentioned excitement, worry, anxiety in business or profession, excessive or prolonged work by a weakly individual. On the other hand, and more especially in women, it has a gradual onset in those who are fanciful and faddy, who have no regular work to do and who take an insufficiency of exercise.

Whatever may be the exact etiology of a particular case nervous dyspepsia comes under treatment in two stages. In one, which may be called the early stage, there are intermittent attacks of dyspepsia, which in many instances are to be ascribed to some particular cause, some period of worry or work, some prolonged excitement (such as the frequent going out to evening parties). The attacks are of short duration—for a fortnight or two months—and are followed by recovery. They vary as regards the symptoms, and in the majority of cases there is one prominent symptom, which persists throughout the whole attack. In the severer cases vomiting is a pronounced symptom, occurring usually directly after taking food, the vomit consisting only of the gastric contents with no blood or mucus. In others vomiting is absent, but there is persistent nausea after each meal. In others, again, the chief symptom is localized pain and tenderness in the epigastrium, not associated with vomiting. The pain, which is very severe and which is usually referred to under the name of gastralgia, is sometimes accompanied by a tenderness of the back as well. Flatulence may be a prominent symptom. The referred symptoms are frequently very distressing, and may be

shown in an utter inability to do work, in listlessness and a tired feeling, and in insomnia. The bowels are usually obstinately constipated, though there may be attacks of lienteric diarrhoea. In some cases the recurrent attacks of indigestion of food, whether from want of treatment or from inappropriate treatment, become continuous, and a severe condition is produced, associated with a profound effect upon nutrition. There is still the prominence of one or more symptoms referable to the nervous system; for example, a persistent nausea after food without vomiting. In others there is great flatulence, whilst in a third case there is severe epigastric pain with localized tenderness, without vomiting; whilst in others there is a prominence of the reflex effects. Wasting is common in such cases and may be profound, so that the body is reduced to almost the condition of a skeleton.

The condition of the stomach of these patients is, as may be judged from the symptoms, somewhat variable. One important feature in such cases is that there is almost invariably atony of the stomach,—that is, weakness of the muscular wall, so that the food is insufficiently churned. In such a stomach a succussion splash is readily obtained. It is an interesting fact that this atony frequently comes on, so to speak, in attacks, which are relieved by the patient's ceasing his occupation and taking a holiday.

As regards the gastric juice, the amount of secretion varies greatly in different cases. In the majority of cases examined by him Leube found that the chemical processes of digestion were normal; but it is probable that in nervous dyspepsia the more common condition is a varying secretion of gastric juice. In some cases, indeed, there is a persistent hypersecretion of the gastric juice, in others at one time hypersecretion, and at another a diminished secretion.

The treatment of nervous dyspepsia presents great difficulties, inasmuch as it is not only a process of indigestion of food in the stomach that has to be counteracted: there is also the general condition to be considered,—that is, the functional disturbance of the nervous system, influenced by heredity, or produced by occupation and by mode of life. No treatment in such cases is successful unless the mode of life be regulated, and very good results are obtained by making such patients take exercise, which must be of a pleasurable kind, such as playing out-door games or bicycling. Dieting is also of great importance, the ordinary food being diminished so as to obtain a diet which gives no distress. Simple remedies need to be given, such as alkalies and acids and aperients. The question of the use of sedatives is a very important one. Much good may be done by small doses of sedatives, and much harm

by the too prolonged continuance of such remedies or by excessive doses. Such patients frequently suffer from restlessness at night and insomnia, for which bromides may be given on going to bed. In many cases it is found that the addition of five or ten grains of bromide of potassium or sodium to an ordinary alkaline bitter mixture, three times daily, is sufficient to give relief. In other cases where there is great distress morphine or cocaine have to be given; morphine in the form of liquor morphinæ hydrochloratis in doses of not more than ten minims, three times a day, or cocaine hydrochlorate, one-twentieth to one-fifth of a grain, twice a day, in pill-form after meals.

As regards drugs it may be said that the first prescription in cases of nervous dyspepsia is always more or less of an experiment, inasmuch as such patients vary greatly regarding their susceptibility and their tolerance of drugs. In some, indeed, and these are chiefly cases of hypersecretion of hydrochloric acid, the administration of acids or of bitters to the patient is extremely harmful, and not infrequently leads to great pain and to vomiting.

In prolonged cases of nervous dyspepsia—that is, in those in which the repeated attacks have become continuous, and which have lasted on and off for several years—the treatment is still more difficult. Such patients may be taking a diet totally unsuitable to their condition, and varying greatly from time to time. At one time, for example, they will take meat; at another, for weeks together, they will take fish, and at another time only milk, and but little relief is obtained by them in their change of diet.

In these prolonged cases, therefore, or when there is great wasting or prolonged nausea, combined with a total inability of following any occupation,—their life being a burden,—the treatment must be one of complete rest and graduated dieting, sedatives and other drugs being given to relieve the prominent symptoms, and the bowels being kept open by aperients or with enemata. This treatment is carried out by making the patient rest in bed, at any rate for the first week. The diet is to be one of milk only, and the choice of milk rests between peptonized milk, sterilized separated milk, and sterilized full milk. The patient is to begin with ten ounces of milk every two hours, night and day, the quantities and the times being varied somewhat according to the amount of distress present, and to the inclination of the patient. Peptonized milk is only of temporary service in such cases, and is especially useful in those cases in which vomiting is a feature. It may soon be replaced by separated milk or full milk, and it is more convenient to administer these sterilized than after simply boiling, inasmuch as

sterilized milk is more palatable. The patient ought to take between two and a half and four pints of milk daily. When this amount of milk agrees, the diet may be increased by adding one or two ounces of Benger's food to the milk twice daily; or the white of an egg, which is to be beaten up with the milk (ten ounces), some salt, and a teaspoonful of Benger's food being added. The milk is then boiled without being stirred so that the white of egg is finally coagulated and uniformly distributed through the liquid. The yolk of egg is not to be given to such patients. When the patient can digest this diet it is to be gradually increased by substituting German rusks for Benger's food, so that milk puddings (made with arrow-root, sago, or tapioca) would soon be taken. Pounded boiled fish is then to be given once a day, and at this period the diet may be rapidly increased to pounded mutton or chicken. The graduated dieting lasts from three to four weeks, and the treatment is greatly aided by the regulation of the bowels, by the administration of acids or alkalies, and occasionally of sedatives. It is also aided by massage, which must be begun very gradually,—namely, a quarter of an hour each day, the extremities and the thorax being gently rubbed. The time of rubbing can then be extended from twenty minutes to half an hour, the back and abdomen being rubbed. The stomach region is to be gently kneaded from left to right, never from right to left, so as to aid the expulsion of the stomach contents into the duodenum.

This treatment is of great benefit to such patients. Sometimes the benefit is permanent. But in cases of nervous dyspepsia relapses are common, and the treatment has to be recommenced.

GASTRIC ULCER: GASTRALGIA.

CLINICAL LECTURE DELIVERED AT THE HOSPITAL COLLEGE OF MEDICINE.

BY THOMAS HUNT STUCKY, M.D., Ph.D.,

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GENTLEMEN,—The first case we bring before you this morning is Miss H., aged twenty-four years. She comes to us for treatment with the history that for several years she has suffered more or less pain in the gastric region; she says that she vomits nearly everything she eats, being only able to retain liquid foods and coffee; that two years ago she expectorated blood on several occasions. This blood, she says, was brown or coffee colored, never being red or clear. Constipation has also been a persistent feature. There is no history of epistaxis, excluding bleeding from the nose as a factor in the case; there is no evidence of pulmonary complication, which excludes, therefore, the lungs as a factor in the production of the trouble. These points, taken in consideration with the fact that the blood was always of a dark-brown color, partially coagulated, make it almost certain that the blood came from the stomach. She is very anæmic, emaciated, and says she has lost flesh gradually since the beginning of her trouble.

Upon a physical examination we find that there is local tenderness at a point near the cardiac orifice of the stomach. Pain is considerably increased on pressure or manipulation. She tells us that the pain and discomfort about the stomach become aggravated whenever food is ingested, and that she experiences some relief after vomiting.

In cases of this kind we should be able to differentiate between gastric ulcer, gastric cancer, cardiac stenosis, and contraction due to specific disease. This patient has a clear history, so that any specific trouble may be excluded. There is no evidence or history of neuralgia or gastralgia, and no indications whatever of disease other than the one we have named, so that there is no question as to the correctness of the diagnosis that we have made of gastric ulcer.

As to the treatment in this case: She applied to us one week ago for advice, and upon superficial examination was given subnitrate of bismuth in ten-grain doses, since which time she says that the vomiting has been less and she feels somewhat improved. The most important thing is to give these patients absolute rest; they should take the least possible amount of food into the stomach; it should be highly nutritious and of a semi-solid or, preferably, fluid character. We want the stomach to do as little work as possible, so that the minimum amount of irritation may be caused, just as we would treat an ulcer upon the skin.

As to whether subnitrate of bismuth should be given in these cases: it is a local astringent, it is a stomachic, and it is a powerful constipator. The latter would seem to be the only objection to be urged against its employment. It is, perhaps, one of the best stomachic agents that we have, and is recognized and accepted by most of the modern text-books; but I prefer the subgallate of bismuth in that it is less constipating, and does not have the same tendency to the production of boli, if you will allow the expression, in the intestines.

Another important point comes up in this connection: In these cases there must necessarily be marked impairment of the digestion, yet all the digestive ferments are contraindicated. If you place an agent like pepsin, lactopeptine, pancreatin, papain, etc., in the stomach, you run the risk of enlarging or predigesting or digesting the ulcer itself; you will stimulate the action of the stomach, and this increased churning process will aggravate and irritate the ulcer, which acts on the same principle as irritating an ulcer in any other part of the body; the condition is aggravated rather than improved. Another agent that is recommended very highly is the nitrate of silver, the danger being the production of argyria or blue tint of the complexion. Absolute rest in bed, as already indicated, is one of the best methods of treatment. Enjoin perfect quiet, and give small quantities of liquid food every four hours.

Another question that comes up here is this: Suppose your patient is suffering from nausea? When this feature is more or less marked most authorities recommend lavage. I am free to confess that this procedure is fraught with considerable danger. There is danger of distention of the stomach, and if the ulceration has extended through the mucous and submucous layer and is entering probably the muscular layer, the danger of over-distention would be to rupture the stomach; but there is no necessity of doing this. We should treat this ulcer on the same principle that we would an ulcer of any other part of the

body, by the employment of aseptic and antiseptic measures. We can cleanse the ulcer thoroughly by irrigating with a small quantity of antiseptic fluid by the siphon method. I have no hesitancy in employing this plan in private practice. I have used one and one-half quarts of antiseptic fluid in irrigating a very sensitive stomach without the production of any bad results. In only one case has there been any trouble following this plan of treatment, and in that case quite a severe hemorrhage resulted, which was controlled by means of hot water.

In the case before us we shall continue the subnitrate or subgallate of bismuth, as it seems to be doing very well, and she will have to continue upon a liquid diet for some time with absolute rest in bed. We shall recommend that she be given beef-tea, beef-soup, buttermilk, or egg-water three or four times a day. In preparing egg-water we take the white of two eggs which is beaten to a froth, adding one pint of water. This makes a very nutritious and palatable drink where patients become tired of beef-tea, milk, etc. A few drops of lemon juice may also be added with benefit. She may also eat custard, charlotte-russe, ice-cream, wine jelly, etc., which do not make much detritus. She may also take finely-chopped raw beef, two or three teaspoonfuls each morning.

Like almost all patients suffering from anæmia, she says that she has profuse leucorrhœa, for which we will advise her to take a boric acid douche once a day.

CASE II.—Miss J., aged forty-two years. This patient states that she has been sick two or three weeks, and gives the history of having constipation, headache, pain in the gastric region, etc. She says she feels something hard in her stomach and it appears to her that her food does not go down. Pain is felt in the stomach sometimes before and sometimes after eating. Pain and discomfort about the stomach are unaffected by the ingestion of food. We find that her tongue is brown and flabby, the tip slightly red. She says she has occasional hot flushes followed by chilly sensations. This case is a typical one of a character often seen in private practice, in which the history is very vague. It is very hard to so isolate the symptoms and peculiarities that an intelligent diagnosis can be made. We find the lung and heart sounds, as far as we are able to make out, perfectly clear. The pulse is full, strong, and normal in volume and rhythm. By percussion we are able to map out a distinct distention of the colon. It is a case in which I am rather uncertain about the diagnosis, and the trouble manifested about the stomach may be aggravated by the intestinal condition. We may have a fermentative gastric or intestinal trouble.

The first step in the treatment of this case would be to thoroughly cleanse the alimentary tract so as to enable us to form some opinion as to the exact state of affairs. It is possible that she may have a gastro-intestinal trouble; it may be due to torpidity of the intestines; it may be due to loss of tonicity in so far as peristalsis or intestinal contraction is concerned. It is certainly not acute, subacute, or chronic gastritis. There is evidently a faulty assimilation, and we shall have to place our patient in a condition to demonstrate where the trouble really is, which may be done by stimulating the secretions thoroughly, and in doing this I would be on the safe side by combining a cholagogue, excitomotor, and stimulator of the pancreatic secretion. We will prescribe for her, then, the following:

R Fel. bovis, grs. xx;
Resin. podophyllin., grs. ii;
Extract. ignatiae, grs. ii;
Extract. aloës aq., grs. x.

Misce et div. in capsul. xx.
Sig.—One to be taken after each meal.

Of the fel bovis we will give twenty grains, which is one grain in each capsule; of the resin, podophyllin, two grains, making one-tenth of a grain in each capsule; extract of ignatiae, which belongs to the strychnine group, being an excitomotor, is a satisfactory stimulator of intestinal peristalsis, in many cases preferable to strychnine, especially in marked brain-fatigue; of this drug we will give two grains, which will make one-tenth of a grain in each capsule; of the aqueous extract of aloës ten grains, making one-half grain to each capsule. We will give the patient these capsules, instructing her to take one after each meal, and request her to report at our next clinic, when we will make a more thorough examination and endeavor to arrive at a positive diagnosis. By that time her bowels will have been thoroughly cleansed.

Ignatia was first brought to the attention of the profession as an excitomotor by the homœopaths. It is one of the few very excellent drugs to which they have called our attention, bryonia being another, and its action is similar to that of strychnine. In many cases the patients bear it better than strychnine, and in brain-fatigue I prefer it to strychnine. It acts very much like kola. It is a drug worth remembering, as it is sometimes of great value.

CASE III.—J. L., female, aged forty years. She comes to us for treatment because of a "misery about the navel" which she says is of four months' duration. The symptoms become aggravated after eating, also when the patient does any heavy work, such as lifting, etc. The

bowels are constipated, and she states that she has to take something all the time to move the bowels. No headache. She gives the history of having had bleeding at the nose two or three times a day for a year. Menstruation is regular, lasting from three to five days at each period, the discharge sometimes being clotted. The point I am trying to make here is to establish a relationship between the epistaxis and menstruation. We sometimes are able to do this in young girls where we have epistaxis regularly at the time of the menstrual flow. Of course in patients at this age (forty years), when they are passing the second climacteric period, we occasionally find the development of a condition identical with that occurring in young girls. In this case the relationship may not be sufficient to make any such claim. She says that she has hot flushes. After eating the pain in the stomach becomes so severe that she drinks a quantity of hot water and by this means obtains relief. She has tenderness and pain beginning in the region of the stomach and extending through into the back, and after drinking hot water she is relieved. Pain is aggravated when the stomach is empty, which she states is not relieved by taking food, but is relieved by distending with fluids. Hot water causes relaxation and gives relief from pain. We find the tongue clean and pale.

Now, an interesting point occurs to us in making a differentiation between this case and the first one presented. In the first instance we have a typical case of ulcer of the stomach ; in this case we have one of gastralgia. In the first case pain is aggravated by taking food into the stomach ; here we have a case in which pain is relieved by distending the stomach with fluids. In the first case relief is obtained by vomiting ; in the case now before you relief follows relaxation by drinking hot water.

We have observed that in all the cases of gastric trouble that have presented themselves at the clinic for treatment there is constipation. Now, the question arises, Would the gastric trouble have developed if the intestinal disturbance had been prevented ; if the performance of the intestinal functions had been regular, if there had been an evacuation normally every twenty-four hours, would these cases of gastric trouble have developed ? I am rather inclined to believe they would not. I think if the eliminative channels—the sewerage, as it were—had been kept open, if the bowels had been stimulated by proper agencies to a normal performance of their functions, that these gastric troubles would not have developed, except from direct irritation. Of course, I do not mean to include acute alcoholism, or cases where young girls are leading irregular lives, etc., as in either of these

cases we are apt to see gastric disturbance as a result; neither do I mean to include cases of men who are debauchees, with the so-called champagne or whiskey stomach. But take those cases in the ordinary course of life,—a great number of gastric disturbances with which we come in contact,—I do not believe they would develop if the eliminative channels were kept open. We cure them by elimination; therefore, if elimination were kept up would they develop? I believe in many cases they would not.

In the case before us we shall have to restore three things: we will have to improve the blood in quality and quantity; we shall have to stimulate the intestinal elimination; we shall have to stimulate all the secretions, especially the gastric secretion. There may be a deficiency of the gastric juice; there may be a deficiency of hydrochloric acid in the stomach; there may be an excess of lactic acid; there may be some fermentative condition of the intestines; there may be some dilatation of the stomach. We have not time to go into these different details this morning. Take the case as it presents itself without differentiating between the minor details; under the head of *gastralgia* we will place her upon the following treatment: papoid, essence of pepsin, and elixir of calisaya mixed. This makes a very palatable mixture, and you will notice I am combining a double preparation. I can give you my reason for making the combination, and can prove to you that if I miss it on the one hand I am safe on the other, and can also prove that both are indicated. We will make the mixture, then, of papoid, essence of pepsin, and elixir of calisaya, a dessertspoonful after each meal.

R. Elixir of calisaya, $\frac{3}{4}$ iv;
Essence of pepsin (Fairchild's preferred), $\frac{3}{4}$ il;
Papoid, $\frac{3}{8}$ s. M.
Sig.—Dessertspoonful after each meal.

This gives us one and one-fourth grains of papoid at each dose and sixteen drachms of the essence of pepsin in a six-ounce mixture. The advantage of papoid is that it acts in any medium. If we have hydrochloric acid in excess it will not interfere with the papoidal action, but it would interfere with the action of pepsin. If lactic acid is in excess, the action of the essence of pepsin will overcome it and the normal secretions will be stimulated by the papoid. If every one of these agents is indicated, and I believe they are, we have them in this mixture, and will further stimulate the gastric secretions by the active principle of calisaya. Suppose we take out the papoid

and use essence of pepsin and calisaya, we would not stimulate or improve the digestive functions if we have an excess of hydrochloric acid, which we could only determine by a chemical analysis. So we are forced to make the combination to meet the indications in every way. If we have an excess of any of the ingredients, we will overcome it with papoid; if we have a deficiency, we supply the means of making it good in this mixture. In addition to this I would give some simple antiseptic, which we can do in the form of a tablet, or we may give the combination of aloin, belladonna, and strychnine. Or we can make one ourselves of cascara sagrada and the other ingredients, of which a vast number are recommended.

There is one other drug to which I wish to call your attention in the treatment of these cases, and that is ipecac. This is a very valuable cholagogue, and is entitled to much more consideration than is usually accorded it. There can be no doubt that it acts favorably upon the liver. Take, for instance, those cases of violent, persistent diarrhoea, where you give thirty grains of ipecac at a dose, you will notice how quickly the diarrhoea will cease and the stools become more normal in appearance within six or eight hours. Ipecac in large doses does not cause vomiting unless there is a full stomach when it is administered. There may result more or less nausea but no vomiting. It is especially indicated in cases of chronic dysentery. Ipecac, in addition to its cholagogic properties, is a general expectorant and stimulates the bronchial secretions. It is well to remember these points.

A CASE OF INTESTINAL AND HEPATIC ACTINOMYCOSIS IN MAN, ASSOCIATED WITH LEUKÆMIA.

REPORT READ BEFORE THE ASSOCIATION OF AMERICAN PHYSICIANS.

BY THOMAS S. LATIMER, M.D.,

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WITH PATHOLOGICAL REPORT.

BY WILLIAM H. WELCH, M.D.,

Professor of Pathology in the Johns Hopkins University.

W. H. T., a colored male, was admitted to the City Hospital on November 17, 1895. He was twenty-one years old, single, and a day laborer. His family history was good, so far as could be learned, except that one brother was said to have died of pulmonary tuberculosis. He had been in excellent health, except for the usual ailments of childhood, up to April of 1894, when he is said to have had an appendicitis, which recurred in July, and again in October, of the same year. Why he was not operated on for the relief of the appendicitis I do not know, nor have I any knowledge of the particulars of these attacks. The patient first came under my observation about the 18th or 19th of November, 1895. He was at this time slightly anaemic, complained of headache, loss of appetite, and obstinate constipation, but was not so ailing as to care to keep his bed.

On the 17th of November, the day he entered the hospital, the evening temperature was 101° F., on the following morning 100°, while on the evening of the latter day it rose to 104°, falling next morning to 98°, and again rising in the evening to 104°, with another morning fall to 98° on the 20th, but rose the same evening to 100.2°, remained at that within a fraction of a degree throughout the 21st, and on the 22d went as low as 97.6°, rising only to 98° in the evening, without further decline next morning. It continued variable throughout the rest of his life, but never again rose above 103.2°, or fell below 98°.

Slight chills and sweats were associated with these variations in temperature. His blood was several times examined for the malarial organism, with negative results.

An examination of his chest discovered nothing wrong except a feeble heart-beat. His liver, however, was found greatly enlarged, extending well below the margin of the ribs, smooth, firm, and somewhat tender. No fluctuation could be found, but a tentative diagnosis of deep-seated hepatic abscess was made. Nothing further was discovered on extending the examination to the other abdominal organs.

On the 22d of November he was referred to the attending surgeon, who on the 23d aspirated the liver in several places without result, whereupon I resumed charge of the case. As I still entertained the opinion that an abscess was forming, not yet sufficiently advanced to yield pus on aspiration, he was put to bed, and saline cathartics were administered to relieve constipation. No particular suffering was for some time experienced, except on lying on the right side, or on manipulation of the liver. This organ continued steadily to increase in size, without presenting any circumscribed area of enlargement, tenderness, or fluctuation. The diagnosis of hepatic abscess was therefore soon abandoned.

The hospital case-book records on December 14 that "the patient is unable to lie on the right side without suffering, his mucous membranes are pale, appetite poor, he is uncomfortable after eating, and the bowels continue costive. Slight general anasarca present. Heart-sounds feeble; pulse weak, soft, and compressible, 120 per minute. The anasarca rapidly increased, together with fluid accumulation in the peritoneal cavity. Respiration now became considerably embarrassed, without indications of direct pulmonary involvement. The dyspnoea was of greater degree than was fairly to be accounted for by interference with the movements of the diaphragm or any recognized pulmonary lesion. The respiratory difficulty, feeble heart and pulse, and pale mucous membranes, with frequent nose-bleeding, suggested an examination of the blood, which was accordingly made, with the following result:

Red corpuscles	8,200,000
White corpuscles	246,000
Small mononuclear leucocytes	8 per cent.
Large mononuclear and transitional leucocytes	4 " "
Polynuclear neutrophiles	58 " "
Eosinophiles	5 " "
Myelocytes	80 " "

Proportion of white to red corpuscles, one to thirteen. Hæmoglobin, twenty-five per cent. Slight enlargement of axillary and post-cervical lymphatic glands was now observed, but beyond this no lymphatic involvement was detected throughout the disease.

Repeated examinations of the region of the spleen were made, without the discovery of appreciable enlargement. The ascites was several times relieved by tapping, which added much to the comfort of the patient. Advantage was taken of the relaxed condition of the abdomen after tapping to search for the spleen, but at no time could I palpate it.

The blood examination, especially the large number of myelocytes, together with the very slight lymphatic and splenic involvement, led me to the conclusion that it was a case of almost pure myelogenous leukæmia, and that the enlarged liver was due to diffused leukæmic infiltration, as in the case described by Welch, in which the liver attained a weight of over thirteen pounds.

The patient was accordingly presented to the class, and his symptoms were considered from this point of view. Nothing was observed in the mouth, except a furred tongue and extreme pallor of the mucous membrane. The teeth were white and sound, the tonsils normal, and the maxillary bones presented no surface-change to attract attention, nor did the patient at any time make complaint of his mouth. No suspicion of actinomycosis was entertained, nor can I now see in re-viewing the clinical history anything that could have suggested such a condition. It is possible that, had an examination been made of whatever small particles were found clinging to the aspirator needle, the microscope might have cleared up the diagnosis. No such examination was made.

It will be observed that at no time while the patient was under my observation was there anything to indicate a present appendicitis. No marked tenderness, except over the liver; no lump; no intestinal disturbance, except a tendency to constipation, easily relieved by cathartics without increase of pain on defecation. If any symptoms to indicate involvement of the appendix were present, they were completely masked by the condition of the liver, the ascites, and the œdema of the abdominal walls.

Varying degrees and sites of pulmonary œdema were repeatedly observed during the progress of the case in the last six weeks of life, which added greatly to the respiratory labor, but measurably diminished at times, notably after the tappings.

When the diagnosis of leukæmia was made, the muriated tincture

of iron with Fowler's solution of arsenic in twenty- and five-minim doses respectively were directed. Milk punches were given three times daily, and he drank freely of milk, of which he was fond. He was not restricted to fluids, however, and at times ate the ordinary hospital fare with apparent relish, although in general his appetite was not good.

As his heart was conspicuously feeble, digitalis was several times prescribed ; but as this did not agree with him, strychnia sulphate, one-thirtieth of a grain, three times a day, was substituted, with better effect. Occasional purges were given, to relieve constipation and with the hope of relieving the dropsical effusion, but with little or no effect so far as the latter was concerned, and owing to the feeble condition of the patient it was not thought expedient to persist in their use. Except the occasional administration of hypnotics and anodynes to procure sleep and relieve pain and dyspncea, nothing further was done.

On January 15 he was tapped for the last time, with considerable relief to the dyspncea, but for a few days only. His strength diminished steadily until February 10, when he died, apparently from asthenia.

Autopsy about five hours after death, by Professor N. G. Keirle and Dr. John Rurah.

"Body of medium-sized man ; development slight. General ana-sarca ; oedema is greater on left side of the body, face and arms especially. Skin pits on pressure everywhere. Over arms and legs fingers can be pressed in two centimetres without difficulty. Abdomen very much distended with fluid. Thin, watery fluid running from mouth and nose. Adipose tissue scanty and almost white in color. Blood running from veins on incision is thin and watery, and lighter in color than normal. Muscles pale and bloodless. Abdomen contains a large quantity of pale straw-colored fluid ; cavity divided into numerous spaces by adhesions, all filled with fluid.

"Pericardium contains about seventy-five centimetres of straw-colored fluid ; visceral layer pale, almost white, glistening throughout. There is considerable serous effusion beneath it, giving a marked cedematous appearance. This is principally around the junction of the auricles with the ventricles. Over the left ventricle chiefly, but also over the other parts of the heart, there are small ecchymoses about one millimetre in diameter. Parietal layer of pericardium is white, bloodless, and glistening throughout. Heart and lungs together weigh two thousand one hundred and ninety grammes. Heart weighs three hundred and forty grammes. White 'milk-patches' on the surface of the right pericardium. All cavities of heart are empty. Tricuspid

orifice thirty-three millimetres in diameter. Valve transparent; no thickening. Pulmonary artery twenty-five millimetres in diameter. Valve transparent and perfect. Mitral orifice thirty-one millimetres in diameter. Valve transparent throughout, with slight tendency to ground glass appearance. Aortic orifice twenty-three millimetres in diameter. Valve shows slight opaque, thickened patches.

" Coronary arteries present pale walls, otherwise normal.

" Thoracic aorta shows the changes of slight endarteritis.

" Left pleural cavity contains five hundred cubic centimetres of pale yellowish fluid; no adhesions. On the right side there are a few adhesions, that break up easily, between visceral and parietal layer of lower lobe. There are a few firm adhesions between lower lobe and diaphragm.

" Right lung pushed up to fourth rib in front, but extended at the back to the tenth rib. No effusions on the right side.

" Left lung slightly pigmented; upper lobe crepitates; oozes white frothy fluid on section. Lower lobe does not crepitate in lower half; oozes a thin, sanious fluid on section. Pieces sink in water. Upper lobe slightly emphysematous. Right lung also crepitates; oozes a pale serum on section. Upper lobe somewhat emphysematous. Middle and lower lobe solid; ooze a bloody but pale serum on section, not at all frothy. Pieces sink in water.

" Peritoneum generally thickened, both parietal and visceral layers. Intestines bound together by peritoneal adhesions. These adhesions are divided off by numerous small spaces, all filled with fluid.

" Omentum very adherent, and without fat. Extending from right iliac fossa, along right margin of the abdominal cavity to the liver, which extends some ten centimetres below the margin of the ribs. Along the costal margin to seven centimetres of the median line is a dense firm mass of organized inflammatory tissue three centimetres in thickness. At the lower part of the same, pus escapes, on cutting out the mass, from a cavity that could not be well determined, as it was all closed in by thick walls of inflammatory tissue.

" Just below the liver about twenty-five cubic centimetres of greenish-yellow pus escaped from an abscess at that point.

" The spleen is slightly enlarged, weight three hundred and fifty grammes; surface, bluish gray. Post-mortem discoloration on lower aspect. Capsule slightly thickened. Spleen substance firm and the color of healthy muscle. Malpighian bodies distinct, trabeculae not very well marked. Left adrenal is slightly enlarged, firm, color of healthy muscle, pigment not very dark. Right adrenal is found

flattened against the liver, of brownish color, otherwise normal. Left kidney weighs two hundred and seventy grammes. Capsule, distended with fluid, almost fell from the kidney when opened. The surface of the kidney is moderately red. Stars of Verheyen show distinctly. The cortex on section is one centimetre thick and irregular ; oozes a pale bloody serum. Cortical vessels indistinct. Glomeruli distinct, but pale and colorless. Irregularity in thickness of cortex apparently due to malformation. The kidney is triangular in shape, base of triangle in the pelvis. It has a swollen look, apparently cloudy swelling. Right kidney corresponds to the left, but is more regular in shape and more oedematous.

"Bladder moderately distended with about two hundred cubic centimetres of urine. Its mucous membrane is very pale. Both testicles extremely pale and oedematous, with small surface cysts. Tunica albuginea remarkably white. Mesentery markedly oedematous. Sigmoid flexure and the remainder of colon to middle of transverse portion apparently normal. The entire ascending colon and the hepatic half of the transverse colon are massed in inflammatory tissue. The ascending colon for six centimetres in its middle could not be removed, is black from post-mortem discolouration. The appendix is involved in a mass of inflammatory tissue just above the brim of the pelvis. Peyer's glands are distinct and present a shaven beard appearance. Bile-duct patent. Liver weighs three thousand two hundred and sixty grammes.

"An examination of the marrow taken from the long bones of the leg shows both macroscopical and microscopical changes characteristic of leukæmia, but nothing to suggest actinomycosis."

EXAMINATION OF THE LIVER, BY DR. W. H. WELCH.

The liver was the only part submitted to me for examination. It had been excised, but was complete. It was preserved in alcohol.

Macroscopic Examination.—The liver presents an irregularly globular shape, measuring twenty-two by eighteen by twelve centimetres. The right lobe, which is much enlarged, is occupied throughout nearly its whole extent by a mass measuring twelve by sixteen centimetres. This mass extends for a short distance also into the left lobe. It extends throughout the whole thickness of the liver, from the lower to the upper surface, but it occupies a larger transverse area in the lower two-thirds than in the upper third of the organ.

The inferior surface of the right lobe, with the exception of a narrow margin of liver substance on the right side, is entirely occupied

by the new growth, which here was apparently continuous with an abscess formation extending downward along the ascending colon. This inferior surface and the posterior margin of the right lobe are connected with a dense mass of fibrous adhesions, in which are included the hepatic vessels, the right adrenal gland, and the hepatic flexure of the colon.

The diaphragm is firmly adherent to the superior surface of the right lobe of the liver, and has been removed with the liver. The mass of new growth in the liver has penetrated through the liver-substance on the upper surface, but has not penetrated through the adherent and thickened diaphragm.

Upon section it is seen that a definite fibrous capsule of dense consistence and grayish color surrounds the mass in the liver, separating it from the surrounding brownish-red parenchyma of the liver. This fibrous capsule is complete, except in certain areas on the inferior surface of the liver or of the new growth, where the opaque, yellowish characteristic foci of the mass come to the surface, and were evidently in connection with the subhepatic abscess. This relation and the general topography afford presumptive evidence that the morbid process invaded the liver from below by continuity.

Upon section the mass presents in an exquisite manner the characteristic, honey-combed appearance of a chronic actinomycotic tumor, as is well shown in the accompanying drawing. (Fig. 1.) There are spaces and interlacing trabeculae. The spaces often anastomose. They vary in shape and size on section, some being round, others oval, others more or less cylindrical. They contain a soft, yellowish-white, purulent material, which can be squeezed out readily, and in which can be detected abundantly the small yellowish granules of the colonies of actinomyces. The immediate margins of the spaces are of an opaque, yellowish-white, necrotic appearance. The spaces vary from one to six or eight millimetres in diameter.

The trabeculae are in general broad and interlacing, and of firm consistence and translucent gray color, like fibrous or granulation-tissue.

Microscopic Examination.—For the study of the histological structure, staining with haematoxylin and osin was used; for the details of the structure of the parasite, Gram's, Weigert's, and Mallory's stains were found most serviceable.

The microscopical sections show interlacing bands of fibrillated connective tissue, rich in long fusiform cells. Between these fibrous bands there are dense accumulations of cells. In the immediate

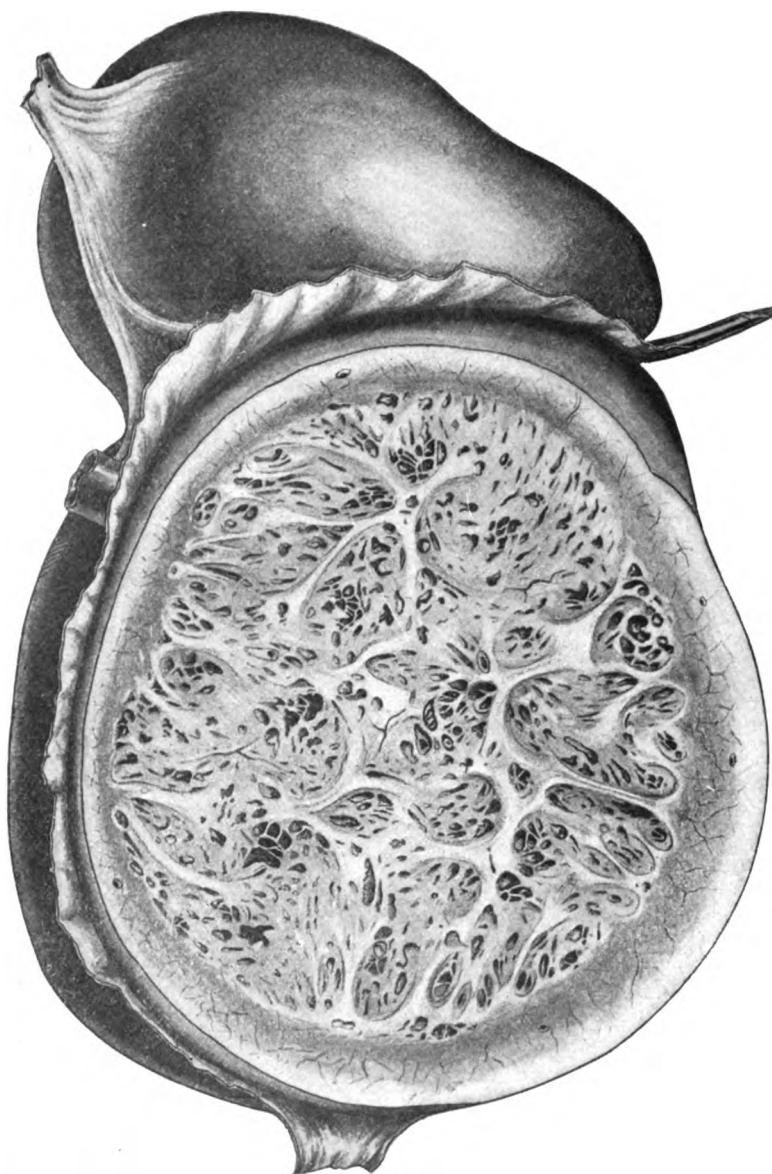


FIG. 1.—Transverse section of the liver showing the honey-combed appearance of the actinomycotic tumor of the right lobe and the fibrous capsule enveloping it.

neighborhood of the actinomyces the cells are closely packed together and there is little or no basement-substance. These cells are predominantly polynuclear leucocytes,—in other words, the parasite colonies lie for the most part in purulent foci. Outside of the areas of actual pus there is granulation-tissue in varying stages of formation, from a tissue composed almost exclusively of granulation cells and leucocytes to a tissue rich in basement-substance and with elongated cells. In the fibrous trabeculae are blood-vessels with thick muscular walls, and containing an excess of leucocytes, among which are many mononuclear forms. Adjacent to the liver parenchyma the fibrous tissue is dense, and contains numerous rows of compressed liver-cells, presenting the appearance of the so-called newly-formed bile-ducts. Here and there are mucous glands derived from those in the walls of the bile-ducts, but now without evident connection with bile-ducts, and apparently hypertrophied and proliferating so as to simulate adenomata. The capillaries of the liver contain an excess of leucocytes, mononuclear cells predominating.

The colonies of actinomyces are rarely single, more frequently they are conglomerated into irregular masses, which may be one to two millimetres in diameter. These colonies in general present a central, looser part of tangled fine filaments and slender rods, with, at times, deeply staining coccus-like bodies, and a more densely-woven ring of fine filaments nearer the periphery, from which the filamentous branching threads radiate outward. These radiating threads often extend out among the surrounding pus-cells, and are devoid of any bulbous swellings or club-like extremities.

It was not found easy to demonstrate satisfactorily the clubs which are frequently found at the extremities of the threads in cases of actinomycosis. The stain recommended by Mallory is most suitable for this demonstration. By this stain there could be demonstrated around some, although not around most, colonies a deeply stained red, almost homogeneous, peripheral zone, into which the blue threads could be traced. This red margin clearly belonged to the parasite and not to the surrounding cells, from which it was often separated by a narrow space. The outer surface of this red border was often somewhat irregular and indented, and in general the impression was gained that this outer zone, which stained by Mallory's method deeply red, consisted of the coalesced material which composes the club-like swellings at the extremities of the threads in most cases of actinomycosis. I am inclined to interpret the failure to demonstrate sharply-defined clubs in this case, and the appearance of a diffuse, homogeneous, pe-

ipheral substance, with the staining reactions of the clubs, to post-mortem changes. That the clubs may become indistinct or even disappear in consequence of post-mortem changes has been demonstrated by Weigert.

But only some of the colonies showed this homogeneous marginal zone. Many were entirely devoid of such a zone or of any suggestion of clubs. It is now well known that actinomycetes colonies are often devoid of the characteristic club-like swellings. In this case, as in that reported by Mallory, there were numerous bacilli belonging to the actinomycetes, scattered among the cells independently of the colonies. Clumps of streptococci were also observed in small number, so that there was mixed infection with actinomycetes and streptococcus.

The mass in the liver, therefore, presents macroscopically and microscopically the typical structure of an actinomycotic tumor. As has already been stated, the evidence is that the parasite gained access to the liver and generated the new growth at the inferior surface of the organ. The process gradually extended so as to invade most of the right lobe and a part of the left lobe of the liver.

Although I have not had the opportunity to examine other parts from this case, there can be little or no doubt, in the light of the clinical history and the observations made at the autopsy and in similar cases, that the portal of entry of the parasite was the intestine, and in all probability the starting-point was actinomycotic appendicitis, possibly colitis, whence the morbid process extended upward in the tissues along the ascending colon to the right hypochondrium, and invaded the liver at its lower surface.

[End of Dr. Welch's report.]

The coexistence of leukæmia with actinomycosis has not, I believe, been noted, and it would be of interest to determine if they may sustain any etiological relation to each other. I cannot find in any of the reports that have come to my notice any reference to examinations of the blood in actinomycosis except for the specific organism, which has not, I believe, been found in it. Nor do I find any reference to general conditions analogous to those occurring in leukæmia that might not be accounted for as the result of the local development. It seems rational, therefore, to conclude that this complication was purely accidental. It must, however, have told very much on the progress of the case, no doubt hastening the end, and adding materially to the suffering of the patient. The labored breathing, although in

part accounted for by the condition of the left lung, the small pleuritic effusion, the recurring pulmonary œdema, the pressure of the enlarged liver and of the ascitic fluid, was doubtless largely due to the defective oxygen-carrying capacity of the blood. So no doubt the unusual extent of the dropsy, affecting nearly every organ and tissue of the body as it did, was rather of leukæmic than actinomycotic origin. No board-like œdematos infiltration such as has been noted with pulmonary actinomycosis was observed, but everywhere a diffuse serous infiltration of ordinary character.

To the leukæmia must also be referred in great part the marked feebleness of the patient beyond what is usually observed in actinomycosis, although this was also to some extent due to the septic condition of which the alternating irregular fevers, chills, and sweats were indications.

The mode of entrance of the infecting organism in this case seems clearly to have been by the alimentary canal. The parasite effected a lodgement in the vicinity of the appendix where its primary development occurred.

This conclusion is warranted by the post-mortem observations as well as by the clinical history, and by previous reports of cases of actinomycotic appendicitis. The patient, living alternately in the country and in the city, was no doubt while in the former in a position to acquire the habit of carelessly chewing grains and other vegetable matter, and may have been in close association with infected cattle; but as no suspicion of the real nature of the trouble was entertained during his life nothing was learned tending to show clearly the source of infection. There is strong reason for doubting whether the disease may be directly communicated from cattle to man by simple contact, indeed, inoculations of the lower animals have been attended with such imperfect success as to make this source of infection unworthy of belief. No case of direct transmission even from cow to cow has been shown. Nor is there any evidence that the disease may be acquired by eating the flesh of infected animals, and the fact that its existence has been reported in but one of the carnivora (a dog) goes far to show that this is a most unlikely mode of propagation. The same may be said of milk as a source of infection. Bollinger had one case, primary in the brain, attributed by him to milk-infection.

The disease has rarely been observed on the udder or teats of cows. Leith refers to an interesting case of infection of the milk-glands of the cow, which he was enabled to examine through the kindness of Professor Mettam, in which the characteristic elements of actinomycosis

were found lying among the galactophorous ducts, which, however, they did not invade.

The tubes notwithstanding showed marked signs of disease, "their living epithelial cells being greatly swollen, staining badly, and being without nuclei. There is also in places a considerable amount of interstitial round-celled infiltration. It is thus seen that the actinomycetes does not itself apparently directly invade the gland tubes in this case. It produces a considerable change in them of a hurtful character, and, further, that it is difficult to believe that the parasite does not in some form or other directly invade the tubes, as the two lie so close together and are so intermingled."¹

Against its transmission to human beings by milk—the possibility of which must be admitted—is its extreme rarity in early childhood. Only four cases in Leith's series of three hundred and seventy-eight cases occurred prior to the fifth year, and only seven up to the tenth year.

The great majority of the cases in which the source of the infection has been definitely established have been of vegetable origin, as in two cases of Boström,—referred to in the Edinburgh Hospital Reports,—in which he found in the primary local lesion grains of barley or corn or other cereals, with the actinomycetes growing abundantly in and from them. Johne, in 1881, demonstrated actinomycetes in vegetable substance found in the tonsils of pigs. Four years later Boström and Pianá separately made the same demonstration in the tongues of oxen, and in 1888 Brazzola and in 1889 Hofman "made similar observations, the latter in a case of the disease in the pharynx of a man."²

Even in the lower animals actinomycosis is practically confined to ungulates,—oxen, horses, pigs,—with the single case among carnivora, reported by Vachetta, in a dog, to which reference has already been made.

Mossbrügger's statistics show that of seventy-six cases only ten were peasants, and of these but two had care of cattle.³ In thirty-eight cases reported by Israel not one was engaged in the management or care of cattle. The far greater frequency with which the mouth and adjacent regions are the seat of the primary affection shows pretty conclusively that the infecting organism is received with the food or drink. Rütimeyer records fifty per cent. in the head and neck, twenty-

¹ Edinburgh Hospital Reports, vol. ii. p. 179.

² Leith, loc. cit.

³ Chrétien, Medical Week, February 1, 1895.

five per cent. in the lungs, fifteen per cent. in the intestines, and fifteen per cent. indeterminate.¹

The intestinal cases were in all probability derived from the food, and even those of primary pulmonary origin may have had a similar mode of entrance, although of these the possibility must be admitted that the organisms were air-borne on bits of chaff or beards of cereals.

The facts that the actinomycetes has not been found in milk nor in water; that the cooking of meats would tend to destroy it; that the disease is more frequent in Germany, where meats are well cooked, than in France and England, where they are more frequently eaten rare; that it occurs in herbivorous and not in carnivorous animals; that although the parasite has not been positively identified in connection with vegetable matter outside the animal body, it has frequently been so found in the site of the disease in the human and in lower animals, all go to make a strong body of evidence in favor of its purely vegetable origin.

Leith's list of cases showing the relative frequency in different occupations lends strong support to the view that it is likely to be introduced with food into the human body; of these ten were coachmen or grooms, thirty-two peasants or workers in the field,—only five of whom were employed about cattle,—twenty-five were farmers or land-owners, three bakers or millers. Thus seventy-five, or three-fourths of the whole number, were engaged in pursuits in which they would be very likely to acquire the habit of carelessly chewing those grains with which the parasite has alone been found associated in the human body. By far the larger proportion of cases has been found in men and in the third decade. Nearly three men to one woman have been affected with the disease, the sex most given to field work, and at the age when men are most actively afield.

There is every reason to believe that this case was one of primary intestinal infection, of which class a considerable number has now been reported. Rütimeyer gives fifteen per cent. of intestinal cases, but Leith, from the records of four hundred and thirty cases, found twenty-one and three-fifths per cent. of abdominal cases, with fifty-five and three-fourths per cent. in the head and neck. Any part of the alimentary canal may be affected, but the stomach with comparative infrequency, from which it may be inferred that the acid gastric juice affects the parasite unfavorably, and that intestinal infection is due, as suggested

¹ Leith, loc. cit.

by Leith, to the protection afforded the parasite by the "grain coats" while in the stomach.

It is not surprising that intestinal cases should be attended with so great a mortality, owing especially to the difficulty in diagnosis, for since the use of potassium iodide has become more common in this affection a sufficient number of cases successfully treated has been reported to strongly support its claim to curative properties in actinomycosis. But it is only where there are primary surface lesions, or when deep-seated lesions have made their way to the surface by ulcerations, or by discharge into the lumen of some natural outlet, as of the bronchial tubes or intestinal canal, so as to make the infectious agents of the disease available for inspection, that the diagnosis can be made, or, indeed, be reasonably suspected. There are absolutely no symptoms distinctive of the disease, or very strongly suggestive of it. Accident may reveal it, as, perhaps, in this case it might, had the aspirator tube, when puncturing for supposed abscess, been examined, or had an operation been done for the appendicitis and a microscopic examination been made.

Possibly repeated examinations of the stools, as in the case of Ransom, where the detection of actinomycetes in the dejecta revealed the nature of the case, would have shown its true nature. But in the absence of any suspicion of the nature of the trouble such examinations are not likely to be made, and when made by one without previous familiarity with the microscopic characters of the parasite they are most likely to be without result.

Perhaps nothing is more strongly distinctive of actinomycosis than its chronicity and the absence of constitutional symptoms, except such as are incident to pus-formation (believed by many to be accidental from associated pyogenic organisms), or the result of destructive changes in important organs by the local development, symptoms, however, which do not differ in any way from those in similar conditions however produced, and are therefore nowise distinctive of actinomycosis.

In the case under consideration I am unable to point to one single feature that was of diagnostic, or even suggestive, value as regards actinomycosis. There is, in short, in the present state of our knowledge absolutely no way of diagnosing this affection when in abdominal, thoracic, or pelvic organs, until some portion of the product of the activity of the actinomycetes or the parasite itself is before us for inspection. Grave doubts may be entertained as to the pathognomonic significance of the wooden edema of the thorax upon which emphasis is laid by Netter in the diagnosis of pulmonary actinomycosis.

Neurology.

SOME UNUSUAL CASES OF MUSCULAR ATROPHY.

CLINICAL LECTURE DELIVERED AT THE BRISTOL ROYAL INFIRMARY.

BY R. SHINGLETON SMITH, M.D., B.Sc., F.R.C.P.,

Physician to the Bristol Royal Infirmary.

GENTLEMEN—We have had many excellent illustrations of late of the various causes and varieties of muscular atrophy. In two of these compression of the cord from disease of the spine has been of especial interest; in both an attempt to relieve the pressure by laminectomy has been made, in the one case with a very satisfactory result, but with absolute failure in the other.

Two other cases have presented features which associate them with the well-known disease—wasting palsy. The relation of this disease to the spinal cord is now well recognized, and it is clearly realized that, the spinal cord being made up of a chain of trophic units, composed of anterior cervical cells in intimate relation with the motor nerves, terminal end organs, and the muscles, any part of this mechanism may be affected, and hence we get varieties of muscular atrophy, depending upon the region more especially implicated. There being a clinical and a pathological unity in the whole group of spinal and muscular types of atrophy, there are differences in relation to the portion of the trophic unit which may be implicated. On the one hand, we have a group in which the muscles primarily are affected; and, on the other hand, we have the ordinary cases of progressive muscular atrophy depending on a wasting of the anterior nerves and pyramidal tracts of the cord. These two groups—the one of central origin, the other of peripheral origin—comprise the different varieties of myopathic atrophy and dystrophy.

Of the group originating in central disease I need only specify the principal varieties known as progressive ophthalmoplegia, bulbar paralysis, the arm and leg types of progressive muscular atrophy, and the amyotrophic lateral sclerosis.

Of the group arising primarily in the muscles numerous varieties have been described by various observers (Erb, Landouzy-Déjerine,

Duchenne, Charcot-Marie, Zimmerlin, and Leyden-Möbius), but the best known of all these is that known as the pseudo-hypertrophic form of muscular dystrophy.

The intermediate connecting link between these two groups must be the peripheral nerves themselves, and these are likely to participate in the pathological conditions of the central trophic nerve-cells, and at the same time with their motor nerve-endings in the muscles.

Over and above all these conditions we must not overlook the influences coming from the cortico-spinal portion of the motor tract; and hence, in analyzing the phenomena of muscular dystrophy, we have to remember that there may be (more or less intermixed) phenomena of intracranial, spinal, and peripheral origin.

Now, commonly these conditions may be more or less separated from each other; the phenomena of peripheral nerve lesion may usually be distinguished from those of intraspinal and intracranial disease. The toxic results of lead and alcohol usually fall primarily on the peripheral nerves, and the nerve-centres escape, but in both cases there are exceptions to that rule, the toxic action being manifested on the nerve-centres as well as on the peripheral nerves.

The cases I have now to comment upon are illustrations of the intermixture of peripheral and central defects. We have the phenomena of a more or less progressive muscular atrophy superadded to those of peripheral neuritis. We have, in fact, a chronic spinal wasting palsy, commencing in the one case with the phenomena of alcoholic neuritis and in the other with lead palsy.

In both cases we have the leading characteristic features of progressive muscular atrophy: (1) the insidious onset commencing in the arms; (2) the absence of any actual paralysis whilst any muscle remains, the weakness depending on and proportionate to the atrophy; (3) the absence of sensory defect, the reflexes not being at first abolished; (4) the sphincters are normal, the faradic response is still present; and (5) well-marked fibrillary tremors are present. On the other hand, we have the history and evidences of multiple alcoholic neuritis in the one case and of fairly characteristic saturnine symmetrical wrist-drop in the other.

Rose C., aged thirty-two, married, living in Bristol, was admitted to the Bristol Royal Infirmary, December 10, 1895, complaining of loss of power in the arms and legs.

The family history is good. She has had three children and three miscarriages; one child died from convulsions. When ten years of age she had scarlet fever, and soon afterwards was laid up for three

months with acute rheumatism. There is a history of occasional fits of an epileptic character ever since her birth. She has been subject to sore throat and has lost her hair on more than one occasion, but there is no evidence of any rash or other signs of syphilis. Her husband has been healthy, but much addicted to alcohol, and she herself admits intemperance.

Early in January, 1894, she first noticed some weakness of the left thumb, and soon afterwards of the right thumb also. Soon she was obliged to give up her occupation as needlewoman, and consequently had more time to indulge in stimulants. The wrists and fingers soon became weak, then the forearms were found to be wasting, the wrists were noticed to drop, and the loss of power involved all the fingers. Six months later the legs were found to be getting weaker and the muscles wasted. In July, 1894, the left knee-jerk was deficient, the right being fairly good ; there was no anæsthesia or analgesia ; there was considerable tenderness of the muscles, and her condition was at that time considered by Dr. Francis Edgeworth to be due to alcoholic neuritis. After being in the hospital for twenty-five days and being satisfied of some improvement, she ran away and resumed her alcoholic dissipation. She was then able to walk, but had some difficulty in feeding herself.

Since December 6, 1895, the patient has been unable to walk, after increasing difficulty during two months. She complained of some pains in the calves of the legs, and there was decided muscular tenderness. There was also some shortness of breath and some difficulty in swallowing fluids.

On December 10, at the time of admission, her condition was as follows : Patient fairly well nourished, of good color, of normal temperature, but unable to walk, feed, or dress herself. She is mentally dull and apparently indifferent to her surroundings.

The muscles of the upper extremities are much atrophied, especially the thenar and hypotenar eminences, the interossei, the extensors of the forearms and the deltoids, giving extreme wrist-drop (Fig. 1), with flexion of the terminal joints of the fingers and thumbs. The arm movements are all feeble on both sides, the left being the worse ; the grasp is weak, the fingers cannot be extended, the hands drop helplessly, and the arms cannot be raised at the shoulder. The atrophy of the forearms is extreme, but fibrillary tremor is now and then present, and can be increased by tapping the muscles with the fingers.

The legs are similarly affected, but to a less degree. All the move-

ments are present, but there is little power. The patient cannot walk without assistance, the feet are inverted, and the toes drop, the muscles are wasted, and fibrillary tremor is easily obtained on tapping the muscles.

The muscles of the thorax are also atrophied, as are also those of the face and larynx: there is much tremor of the tongue and lips, and the voice is feeble.

No sensory defect is present: there is no muscular tenderness; there is no loss of power over the bladder or rectum.

The knee-jerks are completely lost, the plantar reflexes are almost absent, and no abdominal or epigastric reflex can be obtained.

Faradic contractility is present in all the muscles except the extensors of the forearms: galvanic contraction is obtained with twelve to twenty-four Leclanché cells; only a feeble contraction can be obtained in the extensors of the wrists; there is no difference between the anode and cathode. The heart appears to be normal: there is no displacement or murmur; the pulse is of low tension; the urine normal. The lungs are normal, but the intercostal muscles show much fibrillary tremor, and the breathing is labored, the abdominal and cervical muscles being called into unusual activity. The digestive functions are defective; anorexia and dyspeptic symptoms are present, but there is no vomiting. There is no evidence of hepatic or splenic enlargement. The tongue is protruded straight, but the lips and tongue are tremulous: the teeth are much decayed, but there is no blue line on the gums.

On January 6, an examination of the larynx, by Dr. Watson Williams, showed that the left vocal cord was immobile in the cadaveric position, but there was no appearance of atrophy.

Treatment by strychnine hypodermically and by faradism was at once commenced, and after three months there appeared to be a decided improvement.

On April 9, the weight had increased from eighty-one to ninety-one pounds, the patient could feed herself, and was able to walk, the voice had much improved and the vocal cords no longer showed any indication of paralysis; the breathing had improved, and the facial aspect indicated more expression than before. There was, however, no marked improvement in the appearance of the wasted muscles of the limbs, the hands and forearms were weak as before, although there was decidedly less fibrillary tremor. Faradic contraction could still be obtained in all the muscles except the extensors of the wrists, and the galvanic excitability was not greatly in excess: in the forearms a



FIG. 1.—An unusual case of muscular atrophy with extreme wrist drop.

feeble contraction could be obtained with a strong current of twenty cells, and the A. C. C. was greater than the K. C. C.

On April 17 the patient was sent to a convalescent home, and cod-liver oil was prescribed.

In this case it may be assumed that we had to do with the toxic effects of alcohol: at first there was no doubt as to the implication of the peripheral nerves, and at that time there were few indications of damage to the nerve centres: afterwards it seems clear that the phenomena could not be explained thus. The cervical cord and medulla were clearly implicated, and the leading features were those of chronic spinal wasting palsy. The fact that the disease ceased to be progressive after the removal of the cause is only an illustration of what occurs in other conditions due to alcohol. The patient's general nutrition improved and the acute progressive mischief was arrested, but there was no evidence of any actual restoration of the muscles.

The other case is as follows:

Jesse B., aged fifty-two; married; clerk in iron works; living in Monmouthshire: admitted March 27, 1896, to Novi Ward, Bristol Royal Infirmary, complaining of great loss of power in the arms, involving the movements at the wrists, elbows, and shoulders.

His father died at sixty-five, cause unknown; no history of rheumatism, or of any nerve-disease in his family.

The patient states that he once had a similar attack, which was more severe; this was nine years ago: the arms were much the same as now, but the legs also were affected with tenderness of the muscles and shooting pains. The previous attack was thought to be due to lead-poisoning, as there had been previous attacks of colic, but there is no evidence from whence the lead was derived. In November last the patient removed to a new house freshly painted, and also at that time he got wet through: he seems then to have got a considerable chill and shock to his nerves, with which the present attack appears to have commenced.

For the last ten weeks he had been getting weak, the weakness commenced in the wrists, and was first manifested by a difficulty in writing; the shoulders were next affected, and finally the elbows. He has been away from work for five weeks, but has only been four days in bed. All the muscles of the upper extremities have wasted, especially the extensors of the wrists, the thenar and hypothenar eminences, and the shoulder muscles. He has been unable to feed himself, and is not able to grasp anything firmly or to raise the arms to the head. The legs have not been affected, so that there has not been any

difficulty in walking. Patient is unable to raise himself to the sitting position in bed until he rolls round and gets on the elbow.

There has been some tremor of the face, lips, and tongue. He is rather anaemic, but well nourished generally, is of medium height and weight, and has a normal temperature. His general health appears to be good: there is no evidence of visceral lesion; the urine is normal in quantity and quality, with no albumen, and no trace of lead. The bowels are regular, but there is a well-marked blue line along the gums of the lower jaw.

The paralysis of the extensors is complete, the supinator longus being included; the grip of the flexors is very much diminished, but when the forearm is pronated he can flex the elbow. The atrophy of the extensors of the forearms is very marked, as is also that of the triceps and deltoids. There is no apparent defect in the legs, excepting that fibrillary tremors are seen there as well as in the muscles of the upper extremities.

There are no sensory defects: the plantar reflexes are rather in excess, and the knee-jerks are normal.

The extensors and flexors of the wrists give no response to a strong faradic current: the biceps gives a slight and the triceps a well-marked contraction with a strong current. In the extensors of the wrist and the deltoids A. C. C. is greater than K. C. C.

The eyes give no evidence of optic neuritis or degeneration. The fields of vision are slightly diminished, the left more than the right.

He was given iodide of potassium in five-grain doses, and on April 6 he commenced a daily hypodermic dose of five minims of a solution of strychnine (P. B.).

April 21. The muscles had improved somewhat, especially those of the thenar and hypothenar eminences, and the patient was able to raise his hands to his head, although he could not yet feed himself.

May 1. The faradic response was less than before: neither the deltoid, triceps, biceps, nor the supinator longus gave any reaction whatever. Fibrillary tremors are not so excessive, but still very marked. The blue line on the gums had entirely disappeared.

Patient could feed himself with some difficulty, the food being cut up for him. His grasp was somewhat improved. Being satisfied that he was making good progress, he left the hospital on some urgent business. He had gained three pounds in weight since admission.

In this case the selective action of lead, primarily on the peripheral nerves, is well shown, but all the phenomena cannot be so explained: the possibility of the occurrence of a chronic or subacute spinal polio-

myelitis as a result of saturnine-poisoning is commonly recognized, and is described by Dr. E. D. Fisher ("Dercum's Text-Book on Nervous Disease," 1895, Pentland), who makes the following observation :

"In all cases of toxic poisoning by arsenic, mercury, and alcohol, it is now established that while the peripheral nerves are most frequently involved, the whole nervous system may be affected primarily, so that brain and spinal diseases may occur. These paralyses were, not long ago, always considered spinal, and now the pendulum is again swinging back to that view."

These two cases give evidence in favor of this view, that the phenomena of toxic paralysis involve all parts of the nervous system, and give a very close resemblance to spinal poliomyelitis, in combination with peripheral atrophy, both of nerves and muscles. The early implication of the upper extremities and the absence of any marked muscular tenderness differentiate the latter case from neuritis of alcoholic origin.

VASCULAR DISEASE OF THE CENTRAL NERVOUS SYSTEM.

CLINICAL LECTURE DELIVERED AT THE MOABIT HOSPITAL.¹

BY ALFRED GOLDSCHEIDER, M.D.,

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GENTLEMEN,—Vascular disease of the central nervous system presents itself in many shapes, assuming clinical appearances that differ widely. This is not astonishing when you consider the ubiquity of the vascular apparatus and how dependent in the exercise of their function and in their very existence the nerve-cells are upon the blood-vessels. It has taken a long time, moreover, to develop the pathology of the blood-vessels, and it is only recently that their importance in nervous disease has been fully realized. To be sure, we find a small number of cases recorded as far back as fifty years, where vascular changes have been noted as associated with lesions of the nervous system; but these were wrongly interpreted, the affection of the vessels being regarded as a consequence, or at best as a complication, of the morbid process at work on the nervous elements. Charcot believed in a primary inflammation of the ganglion cells, and he therein sought the cause of Waller's descending degeneration. It is only quite recently that a careful post-mortem examination of the vessels in incipient cases of disease has revealed the fact of their being primarily affected: vascular alterations precede and induce the morbid changes within the cells; these latter are subsequent phenomena of a secondary nature. Observations in proof of this view have been published by Pierre Marie, myself, Siemerling, Dauber, Redlich, and others.

Before continuing with the pathology of the vessels of the nervous system, I wish to make some remarks in regard to their anatomy, particularly about the topographical distribution of the vessels of the cord. Our present knowledge is based on the discoveries of Adamkie-

¹ Reported by Dr. H. Cleves-Symmes.

wicz and Kadyi. Previously a long anterior and a long posterior spinal artery were believed to exist, but now we know that an anterior vessel of this kind is a fiction,—what really exists is a tractus anterior, a chain of arterial roots springing from the intercostal arteries and entering the vertebral canal through the intervertebral foramina along with the spinal nerve-roots, then giving off branches by way of the anterior sulcus,—*vasa centralia*,—which supply the anterior horns, the base of the posterior horns, and a narrow strip of white substance bordering on the anterior cornua. The remaining white substance is supplied with blood by a plexus of the pia mater, which originates in the posterior radical arteries.

You have just heard that the primary seat of disease lies in the vessels, not in the ganglionic cells. These latter are often able to resist the disease for a long time. The vascular affection is originally widely disseminated, but not sufficiently intense, except in a comparatively small number of circumscribed spots, to cause final destruction of the ganglionic cells. Also in all but a few small spots the vascular alterations finally disappear.

The clinical forms of disease resulting from vascular affections of the nervous system may be classed under these four heads: *poliomyelitis anterior*, *myelitis disseminata*, *sclerosis multiplex*, and *polioencephalitis disseminata hæmorrhagica*.

1. *Poliomyelitis anterior* is so well known a disease that I shall have but few words to say on the subject. The *acute* form generally attacks children between the ages of two and eleven years, hence its common name “infantile paralysis.” It sets in with fever followed by paralysis of one or more limbs. This paralysis in great part disappears again later on. Those muscles that have not recovered at the end of four or five weeks generally remain lamed and atrophic, finally undergoing fatty degeneration and on electric examination presenting the formula of degeneration.

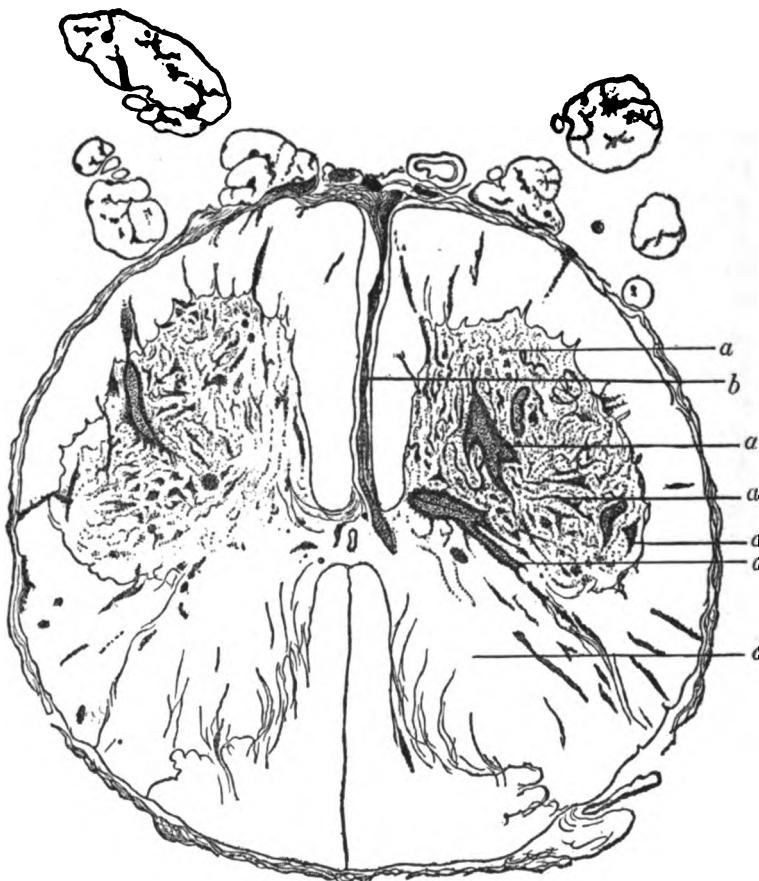
In adults this acute form is more rarely encountered; there the disease is rather inclined to follow a subacute or chronic course. In all other respects it is the same as in children.

Infantile paralysis, as a disease of vascular origin, is confined to those portions of the cord to which the “*vasa centralia*” are tributary: these are, as I mentioned before, the anterior horns, the central region, a part of the base of the posterior horns, and the white substance adjacent to their base.

2. *Disseminated myelitis* is more often found in grown-up people than at a tenderer age. The seats of inflammation resulting from vas-

cular disease are subject to various localization. They may lie in the cord, the medulla, or the pons, or they may be distributed even higher up as an *encephalomyelitis*. Frequently the disease is preceded by

FIG. 1.



Cross-section of cord (magnified 20 diameters). Poliomyelitis anterior. The vessels (a) throughout the anterior gray substance and at the base of the posterior horns are dilated, increased in number, and surrounded by sheaths of proliferated cells. This inflammatory cellular infiltration extends in between the nervous substance, which latter—both ganglion-cells and nerve-fibres—is seen under a high power to be swollen and hydroptic; b, arteria centralis (Kadyi), arteria suci anterioris (Adamkiewicz); c, normal gray substance of the posterior cornua.

some infectious malady, such as variola, typhoid fever, influenza, measles, whooping-cough, erysipelas, diphtheria, etc., to which it is in that case etiologically referable; at other times it may be the result of poisoning, for instance, by carbonic oxide gas; or, finally, it may occur as an independent disease of infectious origin *per se*.

Its clinical aspect is twofold, according to whether the *spinal type* predominates or the symptoms of *acute ataxia*.

The *spinal type* bears a close resemblance to the classical diffuse dorsal myelitis (*myelitis transversa*), causing the same spastic paraplegia of the lower half of the body. But, unlike this disease, it frequently terminates in a more or less complete recovery. It occurs more commonly than is generally supposed, and often passes under the physician's eye undiagnosed owing to the obscurity of the symptoms. I have quite recently had a case of this kind,—a child with spastic paraplegia which had developed as the sequence of whooping-cough two years before. The baths of Ocynhausen greatly improved her condition.

The clinical features of *acute ataxia* present themselves, when the diseased spots are not confined to the cord, but disseminated throughout the central nervous system. This is particularly apt to be the case in the sequelæ of infectious diseases, among which I might have mentioned canine rabies. The term "acute ataxia" has been applied by Leyden to two different conditions,—namely, to this disseminated myeloencephalitis, and, in the second place, to a particular form of acute polyneuritis. The differential diagnosis between these two may give rise to much doubt and difficulty. In neuritis the reflexes are generally abolished, whereas in myeloencephalitis they are commonly preserved or even exaggerated, constituting what has been termed the "myelitic type." Both kinds of acute ataxia offer rather a favorable prognosis, neuritis particularly so.

3. The third shape in which vascular disease may present itself is that of *multiple sclerosis*. There exist records of older date of cases that followed in the wake of infectious maladies and seemed to be of the nature of sequels. But the common tendency, until quite recently, has been to consider this disease always as a chronic complaint. Now, however, that more particular attention has been given to the subject, a number of cases have turned up which could be traced with certainty to an acute or subacute beginning. Sometimes the initial stage was found to lie as far back as thirty years in the patient's childhood. After years of health new onsets would occur, which only those who knew the history of the case could distinguish from a primary attack. In a few cases multiple sclerosis has been observed to develop out of disseminated myelitis on post-mortem evidence. There is no room for doubting that the morbid changes within the nervous substance are the result of primary vascular alteration. In just a few cases, to be sure, this relation to vascular disease was not capable of being demon-

strated, but this was owing, probably, to the disease being of too long standing.

The spinal type of the disease in its symptoms is closely akin to disseminated myelitis, and paraplegia is its most notable feature.

Where the pons is involved we observe the presence of tremor upon attempted voluntary motion. Tremor of this kind is closely related to ataxia. If in a patient with multiple sclerosis you should have occasion, in the course of time, to observe a new onset and to watch the acute development of patches in the pons, then you will be able at first to establish the existence of ataxia of the same clinical aspect as in disseminated myeloencephalitis; out of this ataxia subsequently will be developed volitional tremor.

A certain number of cases, by no means the majority, agree in their symptoms with Charcot's description: presenting rigid muscles, volitional tremor, scanning speech, clonus, nystagmus due to patches of sclerosis in the cord, the medulla, the pons, the pedunculi cerebri, or the brain in general. Patches in one cerebral hemisphere may be evidenced by hemiplegia. A favorite localization is the optic decussation, causing atrophy, partial or total, of the optic nerve. In other cases, again, aphasia, hemianopsia, cerebellar ataxia, etc., may be evolved according as various parts are attacked. The clinical picture for this reason is subject to extreme variability, and there is much deviation from Charcot's classic type. It is of great importance to be acquainted with these atypical forms,—*formes frustes*, Charcot terms them,—as their recognition is thereby much facilitated. They have been roughly divided into four groups, of which the following is an outline:

(a) This group is marked by presenting as a common feature *spastic paralysis of the legs* unassociated with trouble of the bladder or anus. It is differentiated from spastic spinal paralysis by the coexistence of cerebral symptoms, generally manifested in the fundus of the eye.

(b) A second group counterfeits *tumor of the brain*. We often find dementia, optic neuritis, uncertain gait, facial hemiparesis, etc. Acoustic symptoms, "central" deafness, are less frequently encountered.

(c) Here *acute hemiplegia* is the dominant symptom, the patient being suddenly struck down whilst apparently in good health. All sorts of suggestions occur to you as you cast about for an explanation. You think of hemorrhage, of syphilis, of arterio-sclerosis, of a tumor of the brain, whereas in reality this is merely an attack of multiple sclerosis. Close observation rarely fails to elicit confirmatory evidence in the shape of optic neuritis, volitional tremor, impaired articulation, or

some other tell-tale symptom. The condition is liable to great alterations, going as far sometimes as complete recovery.

(d) The fourth and last group of "formes frustes" bears a great resemblance to severe *hysteria*, with which it is easily confounded owing to the presence of hemianæsthesia from patches in the internal capsule and the fornix. The diagnostic difficulty is liable to be enhanced by the presence of real diphtheria.

Before leaving the subject of multiple sclerosis there is one point in regard to the localization of the sclerotic patches that I wish to mention. It appears that the majority of text-books contain a statement to the effect that the white substance—particularly around the ventricles—is affected primarily *by predilection*. That is not, however, a correct way of putting the case, for the fact is lost sight of that there is a great deal more of white substance than of gray in the brain. The white and the gray substances are equally, *in proportion to their amounts*, subject to the disease; there is no question of "predilection." This was first pointed out by Oppenheim.

The same author has published several cases of what he considers as acute encephalitis, which terminated in recovery. In all likelihood these were, in fact, acute stages of multiple sclerosis. I myself have a lady under my care whom I have been treating for the last three years and who exhibited all the features of acute encephalitis (delirium, amaurosis, hemiplegia, bladder trouble, cephalæa, etc.). I was obliged to turn her over for a time to a lunatic asylum. Now these grave symptoms have disappeared, and all that remains are faint indications of multiple sclerosis: paresis of the legs, more marked on one side, which also presents clonus; impaired mobility of the tongue; slightly hesitating articulation; bitemporal pallor of the optic disks; and a slight uncertainty in her gait.

Schlockow has noticed a tendency on the part of zinc-workers to develop a disease distinguished by all the characteristic features of multiple sclerosis. So far, however, there has not been afforded an occasion to verify this diagnosis post mortem.

4. I shall now have to speak of the fourth form of vascular disease,—*disseminated hemorrhagic polioencephalitis* (Wernicke's). We here find the nuclei of different brain-nerves involved, as the motor oculi, then in the order in which they are attacked the trigeminal, the facial, and the abducent nerves. These various combinations result in a total of symptoms very interesting to analyze. Most typical are those of *polioencephalitis superior*, an acute affection of the region about the nucleus of the third nerve, characterized by an acute beginning,

oculomotor paralysis and somnolence, and generally terminating fatally. It seems that morbid alterations in the vicinity of the third ventricle induce a peculiar somnolent condition. Mauthner has even founded a theory of sleep upon this observation. Perhaps "nona," the "sleeping-disease" of the negroes, is due to some disturbance in these parts. Etiologically, polioencephalitis superior appears to be referable to alcoholism or intoxication by other poisons, also to influenza. Gayet and, after him, Wernicke are the discoverers of this disease. In a typical case of my own post-mortem examination revealed multiple perivascular foci in the crura cerebri, the corpus striatum, the thalamus opticus, and in the upper part of the pons.

Wernicke places the disease in a line with infantile spinal paralysis, the brain-nerve nuclei in the cephalic portion of the system being supposed to correspond to the nuclei of the spinal nerves in the cord. To his mind the only real distinction between the two lies in the intensely hemorrhagic character of the former. But now even this barrier seems to be abolished by an observation of Siemerling's, who was able to report an incipient case of infantile paralysis of manifestly hemorrhagic character.

Strümpell has expressed the view that infantile cerebral hemiplegia was the result of an acute disease of the cortex analogous to infantile spinal paralysis. This, however, has proved not to be the case.

Besides the great types hitherto discussed I must mention *three minor groups* likewise dependent on vascular disease :-

5. First, *local softening* of areas in the brain rarely associated with softening in the cord. It is the result of the occlusion of vessels by embolism, thrombosis, or arteritis obliterans. The symptoms consist in hemiplegia, aphasia, senile dementia, and frequently analgesia. Evidence of this condition in the cord is encountered but rarely, and then usually by accident, it not giving rise to symptoms during life. In one of my cases of locomotor ataxia I discovered a small spot of arterio-sclerotic softening in the upper part of the lumbar cord, the existence whereof had not manifested itself clinically.

6. The second group comprises cases of *atrophy* of the cord in consequence of atheromatosis of the vessels. There also apparently occurs in the brain atrophy from arterio-sclerosis. Its clinical symptoms have not so far been defined.

7. In the third place, certain phenomena of a *psychical* and *functional* nature are met with in arterio-sclerosis, such as neurasthenia, hypochondral neurasthenia, abnormal inclination to lassitude, lachry-

mosity, depression, mental feebleness, etc. They are attributable, most likely, to inadequate nutrition of the nervous substance.

In the course of the review that I have given you you will have perceived that the first four types of disease enumerated—infantile paralysis, disseminated myelitis, multiple sclerosis, and disseminated hemorrhagic polioencephalitis—have this in common ; that they all furnish an etiological history of infection or intoxication. Their clinical development also in some cases resembles that of infectious diseases. Thus epidemic occurrences of infantile paralysis have come under observation in Sweden, Norway, Lyon, and also in Germany. The disease has also been among the sequelæ of measles, etc. The entire initial period, setting in, as it does, with high fever, bears an infectious character ; occasionally, that is to say, where attention was paid to the matter, a swelling of the spleen has been noticed.

Treatment.—All these affections are reducible, as we have seen, to a common source, consisting in vascular trouble, but for therapeutic purposes this circumstance is of little value. We have no means of causal treatment at command. Ergot and other drugs supposed to act on the vessels are useless. We are thrown back, therefore, on our usual remedial procedures in cerebro-spinal disease.

The first stage of all these conditions calls for treatment by *rest*, which must be continued so long as there is any danger of hemorrhage recurring ; for instance, in infantile paralysis. After the lapse of a couple of weeks, when the paralyzed muscles are beginning to recover, then is the time to use *the galvanic battery*. The faradic current would not prove serviceable, since we here encounter the formula of degeneration. The idea is simply to evoke contractions : it is not enough, therefore, to allow the current to merely pass steadily through the muscles, but we must be continually interrupting it, so as to produce shocks. Where the muscular irritability is much diminished the current must be reversed each time.

In the way of drugs I recommend you to try *strychnine* and *potassium iodide*. Strychnine may be administered either hypodermically or in pills, children to receive between one-half and one milligramme ($= \frac{1}{20}$ to $\frac{1}{10}$ grain) a day, adults up to one centigramme ($= \frac{1}{4}$ grain) *per diem*. It is also used to advantage in polyneuritis. After taking the drug for a while the patients are apt to exhibit symptoms of its having extended its influence from the motor to the sensory sphere (increased excitability and sensitiveness to pain, paraesthesia, etc.). Then you must discontinue its use. Children in this respect require to be watched with particular care. Potassium iodide, according to

my experience, is of great value in multiple sclerosis, where you should never fail to employ it.

Nor must you neglect the use of active and passive *exercise* methodically directed, so as to bring the right muscles into play. Gymnastics, bandages, and orthopaedic apparatus may all have to be utilized.

In adults it is well to reinforce your other measures for the treatment of paralysis by using the influence of *suggestion*. It is often the case that they are unable to move a limb because they cannot bring their mind to the pitch of *willing* the motion, since they consider it impossible. Such cases should be put in a bath, where the water takes so much off from the weight of the limb; or you may manually assist them in executing the desired motion. This encourages them to start innervating the muscular groups concerned, at first without visible effect, later on successfully. The results thus obtained may be further enhanced by making the patient walk about in a "walking-chair" (Gehstuhl), a contrivance which we have borrowed from the surgeons. This is a square frame running on rollers and closed on three sides, in which the patient is placed and in which he walks or shuffles along, supporting himself by its top as he would by crutches. Later on various kinds of apparatus may be used, such as rowing-machines, stout strips of india-rubber at which the patient is made to pull in different ways, and so forth.

It stands to reason that a complete recovery is scarcely ever to be obtained in these diseases,—I mean the term recovery in an anatomical sense,—since certain nervous elements have generally undergone destruction once and for all time. But it is quite often in our power to cause nearly all the symptoms to disappear. In infantile paralysis some of the muscles generally remain refractory. In multiple sclerosis the probability of a new attack must always be borne in mind.

CIRCULAR INSANITY. (FOLIE CIRCULARE: FOLIE, A DOUBLE FORME.)

CLINICAL LECTURE DELIVERED AT THE LONG ISLAND COLLEGE HOSPITAL.

BY JOHN C. SHAW, M.D.,

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GENTLEMEN,—The youth before you has just been sent in from the clinic for our examination. Please to observe his general appearance and attitude; his head is held down, his eyes fixed on the floor, his facial expression is dull, stupid, and apathetic; I question him and he makes no reply, he does not change his position or facial expression in the least. Information as to his condition must be obtained from his mother who accompanies him. He is seventeen years of age. He enjoyed good health until two years ago, when he came home from school one day complaining of pain in his head, he began to "wander in his mind." Since that time he has had attacks lasting three weeks, during which he is depressed and stupid as you now see him. He sits in one place and in the same attitude all day; he never speaks. At the end of three weeks he passes from this state into one of mental and physical activity. Whether this change takes place suddenly or gradually his mother is unable to state. In this state of excitement he runs about a great deal, talks constantly, gets into all kinds of mischief, and quarrels with the other boys. This condition of over-activity lasts three weeks, when he again passes into the depressed stupid state. There has been a constant repetition of these two alternating states in the past two years. Examination of the boy shows the circulation to be defective; his hands are blue and cold; his pulse is normal in the number of beats, but is feeble in power. The heart and lungs are normal; he has not lost flesh. The mother knows of no member of the family or its branches who has suffered from any nervous disease or insanity. I have no hesitancy, even with this brief

and somewhat imperfect history, in making a diagnosis of circular insanity.

This is one of the varieties of periodic insanity ; the characteristics of which are the return at more or less regular periods of a mental disorder presenting the same features at each recurrent attack, and each attack separated by an interval of apparent sanity. These forms of mental disorder are almost invariably evidences of degeneration. They are manifested in persons who are descended from ancestors who have suffered from insanity or other forms of grave nervous disorder. To make the picture of this mental disease more complete we will look over the history of a typical case which was under my observation for a long time.

CASE II.—A man aged thirty-two ; married. He has always enjoyed good physical health. His maternal grandmother suffered from the same mental disorder that he does. It cannot be learned if any other member of the family has suffered from any form of nervous disorder. He had his first attack of mental disturbance when he was twenty-one years old. All that can be learned of that attack is that he hired a horse from a livery stable, drove it to Huntington, on Long Island, and about the country so that he injured it, and his family had to pay damages. This caused his admission to an asylum, from which he was discharged in four months. He appears to have had his next attack in 1877. The history is obtained from his wife. In June, 1877, he became despondent : he would not go out of the house, walked about the room, pulled all the window-shades down ; often looked out of the window by pulling the shade cautiously aside ; he was suspicious that some one was coming after him, but he never fully expressed delusions of persecution. He would not speak to any one except his wife and mother, and only when they spoke to him ; if any other person came into the room he would run away ; he grew thin, and had "chills," "shivering constantly," his hands and feet looked blue. This condition lasted until August of that year. The mental depression and other symptoms passed away by degrees ; the first evidence of this improvement was manifested by his asking to go to church and subsequently to visit his wife's family. This gradual improvement lasted about one month, and his wife thought he was well. But during this interval, although he appeared to be well, he made no attempt to work, but walked about, went to church and other places. He remained in this condition until April, 1878, when a change came over him : he showed a lack of affection towards his mother ; he found fault with and scolded her, which was quite contrary to his habit. He

became unnaturally energetic. He engaged in the manufacture of and sale of soap ; hired men at large wages ; ordered large quantities of seed for a very small garden ; hired a man to do farming in his back yard (of a city house). Ordered three barrels of seed potatoes and large quantities of manure and other things ; among them three kegs of beer from a brewer ; bought porterhouse steaks and gave them to dogs he saw in the streets. His wife says during this time he talked naturally but extravagantly. He could not sleep at night ; wandered about in a restless manner night and day ; ate irregularly. His extravagant actions became so extreme that he was placed in an asylum on May 17, 1878, where he remained until August, 1878. Wishing to, he was allowed to manage his own affairs. He engaged in an express business with fifteen hundred dollars. He bought quantities of harness and horses ; much more than he needed ; spent money freely. Did not attend to his business. In June, 1879, he gradually passed from this state of exaltation into one of depression, which was also gradual in its approach. He again, as in former attacks, remained in his house ; he did not feed his horses. His stable having caught fire, he would not go to get his horses out of the burning building, refusing to give the keys to any one, saying, "Oh, never mind, I will attend to it in the morning." He slept constantly ; his wife had to dress him and wash his face ; he would not speak, but had the delusion that some men were after him. In November or December of this year he was placed in the asylum, while he was still in this depressed state. He remained there until March or April, 1880. In about two months after this period he again became excited and extravagant, engaged in the express and ice business, but did not attend to it. Bought wagons he saw on the street, but did not pay for them. Tried to sell his property, indulged in a great many extravagant and insane acts until it became again necessary to send him to an asylum in July, 1880, where he remained until November, 1880. After his removal from the asylum he became excited in manner, extravagant in conversation, and lavish in the expenditure of money, with a decided tendency to the excessive use of stimulants. This phase lasted about two months, after which he appeared well until November, 1882, when he gradually passed into a state of melancholia which lasted until February, 1883. In these attacks of melancholia, which always come on gradually, he becomes apathetic, loses interest in things about him, assumes gradually a somewhat distressed facial expression ; the circulation becomes defective, the hands bluish and cold, the face slightly dusky from the same cause ; the pulse gradually grows more and more feeble ; the remaining

activity, which admits of his going to the window to look out in his anxiety lest some one should be coming after him, is soon replaced by complete apathy and stupor, in which he sits in one place with his head bent forward, his facial expression that of typical melancholia with stupor. He has to be conducted to his meals or they are brought to him. He hardly eats even then; he loses flesh and becomes often quite emaciated. He passes after a time gradually from this state to the opposite one of mental and physical excitement; all the bodily functions partake of this change, the circulation becomes active, the cold blue skin becomes warm and of a natural color, the appetite good. He gains in flesh.

In the asylum he walks up and down the ward in an animated, brisk manner, talks constantly, makes a point of shaking hands and conversing with every visitor who enters. He tries to occupy the entire time of the physician. In conversation he passes rapidly from one subject to another, it is impossible to keep his attention fixed for any length of time on one subject. He is very fond of talking about himself; has exalted ideas of his own importance and abilities. He has a peculiar manner of expressing his ideas so as to make them appear extravagant and important. He states that he owns eight horses; if you question him about them, he says, "Oh, I have not got them now, I used to own them." Talks of a horse he used to drive a couple of summers ago; says he did not own it, but was about to buy it; the man wanted one hundred and fifty dollars, which he thought was too much, but adds that the horse could trot in 2.30. He writes a great many letters which, on the whole, are sensible. Frequently makes complaints of being ill; says he has Bright's disease; on another day he has sore throat, etc. Examination shows that he has none of these various ailments that he from time to time complains of. His appetite is voracious, and he remarks that he can eat five pounds of meat at once. He is sleepless and restless at night. Passes urine frequently and in increased quantity; it contains no sugar.

He pastes pictures all over the walls of his room. Wears a canvas cap made for him by another patient; on the front of the cap he has written in large capital letters the name of what he says is a social club to which he belongs. He is always dressed neatly. He is disposed to be mischievous; he steals things from the other patients, and uses or destroys them. He makes attempts at breaking the windows and then denies that he has done so. He makes demands of the nurses which they cannot comply with; he then uses abusive language towards them and threatens that he will have them discharged as soon as the doctor

comes into the ward. On questioning him as to his own condition, he gives a very good account of his illness, and while talking about it appears to fully appreciate his abnormal condition. He says his first attack was in 1869, and every year since he has had trouble. Each November he passes into a dull, stupid state, is unable to speak, sits on a chair all day, will not go out, does not wish to see any one, goes to bed as soon as it is dark. When his wife speaks to him he cannot answer her. He can read the newspaper, but cannot understand properly what he reads. His hands and nails become blue, and his eyes sunken; he knows what is going on around him, but takes no interest. This state lasts each year until February, when he suddenly passes out of it, becomes bright, "Tells his wife to bring him his good clothes and his jewelry; he dresses up, and goes out to the theatre, church, and other places." This state lasts until the next November, when he again becomes depressed. This is the patient's account of his own condition; it is not quite accurate as to the time of the attacks, but it is a very good statement of his condition. This statement was made when he was in one of the maniacal states. This is a very typical case of severe circular insanity.

As a contrast to this severe case, let us take a glance at a milder one; such a case as you not infrequently meet with in private practice; these mild cases are rarely sent to asylums.

CASE III.—A lady, thirty-five years of age, married, the mother of two children. In the past three years she has suffered from attacks characterized by mental depression which last six weeks, during which the bowels are constipated, less urine is passed, pulse between sixty and seventy, feeble and irregular in force of beat. She can eat, but everything tastes alike to her. Her will-power is weak; she often tries to decide upon some work to be done, but finds that she cannot. She can be led about like a child. The gloomy feeling is very decided, but it is more a feeling of uncertainty or uneasiness than depression. Time appears to her to be passing very rapidly. She is conscious that she is not accomplishing anything. This is followed by an opposite state, the transition occupying a few days. In this second state she feels very active, ambitious. She busies herself about the care of her house. Time appears to pass very rapidly. Other than this mental disorder she is in good physical health.

The diagnosis in these cases must be made on the history of the alternating periods of melancholia and the maniacal state.

The prognosis in these cases is unfavorable as to recovery. They may, however, live a long life but afflicted with this disorder of mind

which makes them miserable and unfit for the duties of life. Treatment is of little service in these cases. The cycle of mental disorder cannot be prevented by any medicines. Many of these persons live a long life without being confined to an asylum, but they are always a source of anxiety and worry to their relations and friends, owing mainly to their irrational and extravagant behavior during the maniacal period.

Surgery.

CASTRATION FOR THE RADICAL CURE OF CHRONIC HYPERSTROPHY OF THE PROSTATE GLAND.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY HOSPITAL.¹

BY J. WILLIAM WHITE, M.D.,

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LECTURE I.

GENTLEMEN,—The case which we have before us this morning is one on which I propose to perform the operation of castration for the radical cure of an hypertrophied prostate. The operation itself is a very simple one, requiring, as you know, but a few moments. Many of you, doubtless, were at my clinic held in this room in January, 1894, when we had a similar operation, and will recall what I said at that time. Since then our knowledge of the subject has been greatly increased by the light of clinical experience, and I can now speak with a great deal more confidence and certainty of the value of the operation, and the results which we may expect to obtain. However, the operation is yet in its infancy. Before taking up the present case and proceeding with the operation, I may review briefly the history of the operation itself in its relation to hypertrophy of the prostate, and what we may expect from it in suitable cases.

In the spring of 1892, Dr. John S. Billings, of Washington, asked me to prepare a paper on the surgery of hypertrophied prostate, to be read before the annual meeting of the American Surgical Society. I told him that I would do so, but that for some time I had contemplated a series of experiments on the prostate to see what effect castration would produce in the size of the gland, with the idea of ascertaining whether it would be of any practical value in the treatment of hypertrophy, and that I should like to carry them out before pre-

¹ Reported by Henry L. Williams, M.D.

paring the article. Accordingly, in October of that year, I directed Dr. Kirby to make a series of experiments on dogs to determine whether castration would be followed by notable atrophy, and control observations as to the weight of normal prostates in dogs; these were begun at once. The first castration was performed on January 27, 1893, and others followed at intervals of a few days. The results showed a rapid atrophy, first of the glandular and then of the muscular element, and were so decisive that I embodied them in my paper, which was read before the American Surgical Association June 1, 1893, with the suggestion that castration might be a valuable therapeutic measure in many cases of hypertrophied prostate. Up to that time the suggestion had never been laid before the profession.

The thought that atrophy of an hypertrophied prostate might possibly follow castration had been suggested to me by the comparison long ago made by Velpeau, and afterwards by Sir Henry Thompson, between prostatic and uterine fibromata, coupled with the well-known fact that, in the female, oophorectomy causes a disappearance of these growths, and an atrophy of the uterus itself. Observations made by John Hunter, Owen, and Griffiths as to the changes in the size of the prostate of the mole, hedgehog, and other animals in and out of rutting season, and as to the effect of castration in various species of animals in producing prostatic atrophy, gave me additional light.

These observations, however, appear to have been confined to animals already castrated for other reasons, no mention being made of a definite series of experiments. Nor can I find any reference in surgical literature to a possible application of these facts in the treatment of hypertrophied prostate.

Theoretically, the line of argument was as follows: The prostate, while not embryologically the true homologue of the uterus, is developed from structures quite distinct from those that form the urinary passages. The structure of the prostate and that of the uterus are strikingly similar, and would be almost identical if the tubular glands found in the inner walls of the uterus were prolonged into its substance. The growth of the organ is in direct relation with the sexual life of the individual; its overgrowth occurs at a period when the sexual life is fading out, but is not extinct. The reproductive life ends sooner in the female than in the male, and, accordingly, we find fibromyomata appearing earlier in the former than in the latter. The histology of these growths, varying from small encapsulated tumors easily shelled out, or polypoid growths intimately connected with the uterus or prostate, up to the enormous growths which far exceed the

original bulk of the organ itself, is identical. There may be in either case a general hypertrophic enlargement affecting the whole organ.

In the female uterine tumors do not appear after the menopause, or, if present, undergo atrophy at this time. In the male after a certain period of life there is no tendency to enlargement of the prostate, but rather the reverse.

These disturbances occur at about the same time in the sexual life of the two sexes,—that is, during the latter half of the reproductive period, and as this ends sooner in the female than in the male, we accordingly find growths appearing in the former at a somewhat earlier age.

This analogy is said by embryologists to be without foundation as regards any true homology between the prostate and the uterus. The clinical resemblance between the two forms of overgrowth are, however, none the less striking, and it may now be said that the results of castration in such cases are equally similar and remarkable in both sexes. I am quite willing to accept Moullin's way of putting it: "Enlargement of the prostate bears the same relation to the testes that fibroid disease of the uterus does to the ovaries. But the fact that they bear the same relation to two different organs is no proof that they bear any relation to each other."

I must add, however, that, although the prostate is not the absolute homologue of the uterus, yet as it *contains* and encircles the cavity which is said to be its homologue,—*i.e.*, the utricle or "prostatic vesicle,"—the relation between the two is remarkably close. So, too, although the uterine growths begin as fibromyomata and the prostatic as adenomata, or adeno-fibromata, the difference merely corresponds with the difference in structure of the two organs.

As I have just stated, oophorectomy tends to cause a disappearance of these growths and an atrophy of the uterus itself. Castration almost certainly has the same effect upon the normal prostate in our species, and I have experimentally demonstrated that it has such an effect in dogs.

The fact that we have no example of spontaneous shrinking of the hypertrophied prostate in old age may be explained by the great frequency with which the trouble causes death in such cases.

Messer's tables, founded on a dissection of one hundred prostates in men over sixty years of age, show that of the prostates weighing over six drachms, only 22.8 per cent. were from subjects eighty years of age or more, while of those weighing less than six drachms, 35.3 per cent. were from octogenarians, many of them being less than normal.

This not only confirms the observation made by Desno, that after a certain period of life the frequency of notable hypertrophy diminishes, but it suggests the possibility that in many of these cases physiological atrophy has already begun. The subjects from which Messer compiled his statistics were not selected from among patients, but were taken just as they happened to come within his reach.

The uncertainty as to the exact duration of sexual life in the male also weakens the force of the statement that the condition does not manifest itself until after the period of life when it should occur if it were truly homologous with the uterine growth. In addition, I may say that there is accumulating evidence that prostatic hypertrophy begins during middle life much more frequently than was formerly supposed, and that the statistics on which we have been accustomed to rely, based on museum specimens and on the experience of surgeons to whom the patients apply only when distinct subjective symptoms have developed, are to an extent unreliable.

Having reasoned the matter out in this way and demonstrated by experiments upon dogs that atrophy of the prostate takes place in them with extreme rapidity after removal of the testicles, I felt justified in recommending to the profession the operation of castration for the cure of hypertrophy of the prostate.

Abstracts from the article were published during June, 1893, in most of the medical magazines in this country, and in August it appeared in its entirety in the *Annals of Surgery*.

On the second of September, Ramm, of Christiania, announced his first two operations in the *Centralblatt für Chirurgie*, and in the December number of the *Medical News*, Dr. Francis L. Haynes, of Los Angeles, California, announced the first operation to be performed on the 31st of January, 1894.

Since then I have received or read reports of at least one hundred operations,¹ many of which have been published and the others will be soon. In some a complete recovery has been reported, while in the majority there has been a marked improvement; the least favorable of these have experienced greater relief than has been obtained by any method heretofore employed.

It is estimated that about fifty per cent. of men over fifty years of age have hypertrophied prostates, and of these cases about ten per cent. become pathological. According to the last census, there are in this country to-day more than three million men over fifty years old. Of

¹ This was in December, 1894.

these, according to the estimate of Sir Henry Thompson, which genito-urinary specialists consider a conservative one, about two hundred thousand are suffering from hypertrophy of this gland.

The lives of all these are at least threatened, for, if the hypertrophy goes on until it produces obstruction and this is not removed, the health is rapidly undermined by the retention of urine and the consequent fermentative changes, the deleterious influence of backward pressure on the kidneys, the frequent use of the catheter, and the loss of sleep incident to the incessant demand to void urine.

Until the present time the surgeon has been unable to afford distinct relief to the distressing symptoms of many of the advanced cases of this affection.

In a number of instances some form of prostatectomy has been performed if the general condition of the patient would permit; but the mortality is naturally large, and the results are often disappointing. Prostatotomy is but little more than a palliative measure and affords but temporary relief.

Without taking time to discuss the relative merits of the various operations, I will simply say that all are of such gravity as to be often contraindicated in the very cases in which the demand for relief is most urgent.

It would be absurd to imagine for a moment that I advocate a wholesale excision of the testicles in all cases of hypertrophied prostate. Having viewed with disapprobation the indiscriminating assaults of some extremists upon the urethra, the tubes and ovaries, and more recently upon the appendix, I did not want to be responsible for a similar attack upon the testicles, and recommended the operation with some hesitation.

But I do say that of the two hundred thousand men in this country with hypertrophied prostates there are doubtless many whose lives could be prolonged and who could be relieved of great pain and suffering by the performance of castration.

The objections to the operation seem to be almost entirely sentimental ones. It is natural that a man shrinks from the idea of losing his testicles, but when we consider that the appropriate subject for this operation has almost, if not quite, outlived the time of sexual activity, and has only a few short years of misery and torment to look forward to, I think we will find that there are many who will be willing to sacrifice the evidences of a "*virilité passée*" for an old age of mental and physical repose and intellectual enjoyment.

Taking up now the case before us, we have a history as follows:

R. P., aged sixty; weight about one hundred and thirty-five pounds; white; carpenter by trade; born in Maine; married.

Family history negative.

Previous History.—Has had gonorrhœa three or four times; last attack one year ago. He says that he had bladder trouble at the same time, but was cured in three weeks. Presents a history of prostatic discharge at stool fifteen years ago, which, however, only occurred when he was constipated and had to strain very hard. This lasted ten years.

Previous Treatment.—He has undergone various forms of internal treatment, in spite of which he has been urinating hourly, and has used the catheter (with increased frequency) for years. His distress had become so great that he came for advice and for a rest in the hospital. He was much broken down by long-continued suffering, but is exceptionally intelligent for a hospital patient.

Present Trouble.—Eighteen months ago he noticed frequency of urination accompanied with dizziness, sometimes before, at other times after, urination. Voided urine eight times during the twenty-four hours, and had to get up several times during the night.

On admission to the hospital, November 16, 1894, he complained of frequent imperative urination, urinating ten times in twenty-four hours. In the ward class examination the vesical sound revealed no stone. Examination per rectum showed a prostate the size of an orange. The finger could not reach the upper border. The lateral enlargement was very marked, the borders of the gland nearly touching the rami of the ischium. It was moderately firm, and slightly elastic upon pressure. A soft catheter went in with a little difficulty. Urine began to flow when the eye was about ten inches from the meatus. The amount of residual urine averaged six ounces. He was using a catheter from four to eight times daily, and urinating, or attempting to urinate, from twelve to twenty-four times (occasionally oftener) in twenty-four hours. The urine contained blood and pus, but no casts. It was stinking and loaded with mucus. Castration was advised, but was refused. He was admitted to the ward, the bladder was irrigated daily, and the urine sterilized as far as possible by the administration of salol and boric acid; recumbency with the pelvis slightly elevated was maintained, and the diet carefully regulated, milk chiefly being given.

He obtained some relief from these measures, but there was no change in the quantity of residual urine. He was taught the proper use of the catheter, instructed how to keep it sterile, and allowed to leave the hospital.

One week ago to-day he returned to the hospital much worse, with all the above symptoms exaggerated ; urine was voided every hour, attended with much pain. He complained of burning sensations in the bladder and was greatly disheartened. He was much weaker, and said something must be done at once to relieve him of his trouble.

Examination showed residual urine two ounces, bladder capacity eight ounces ; length of urethra eight and three-fourths inches ; prostate, per rectum, the size of an orange.

During the last week he has been given four grains of sulphate of quinine twice a day, ten grains of boric acid, and five grains of salol, each thrice a day.

I sincerely believe that the condition of the patient warrants castration, and shall, therefore, proceed to perform the operation.

[Dr. White then performed a double castration, under ether ; the cords were tied with silk, and the wound sewed up without drainage. The time of the operation, including stitches, was three minutes.

Improvement in urination became manifest in the first twenty-four hours after operation. In a week the patient emptied the bladder easily and painlessly, the urine was clear, and the frequency of urination had decreased to five or six times daily. The residual urine had diminished to one-half an ounce, and two weeks after the operation but one fluid drachm remained after urination. He was examined (before the class) one week after the operation, and the prostate found to be merely a flattened fibrous mass, the upper border being easily reached, and the lateral borders shading off insensibly so that its limits in those directions were difficult to determine. The bulging into the rectum, previously so unmistakable, had disappeared. The prostate itself might almost be said to have done so. A catheter inserted eight and a quarter inches drew a few drops of urine. The patient described to the class the change in the character of his urination, and said that "he felt like a new man."

He remained as an assistant in the surgical wards for four months, and during this time on three occasions a little increased frequency in urination occurred, each time associated with digestive disturbances.

He left the hospital apparently cured.]

LECTURE II.

GENTLEMEN,—The first case which I have the pleasure of bringing to your attention this morning is an interesting one, and affords us an excellent opportunity to speak of the chronic pathological condition

often found in the prostate, and to consider briefly the relative merits of the measures which may be taken for its relief.

This man whom you see before you is sixty-seven years of age and has had difficulty in passing his urine for a number of years. He has been under careful treatment for several months without having his condition bettered. On the contrary, his symptoms have become more severe and he is in almost constant distress. At the present time the catheter has to be passed seven or eight times daily. Of late this has caused great pain, and has occasionally been attended with considerable hemorrhage.

The sound has not been able to demonstrate the presence of stone in his bladder.

A digital examination reveals a prostate the size of a large hen's egg.

He has had set before him the exact state of affairs and has accepted the method of treatment by castration, which has been recommended.

It is that operation which I propose to perform this morning, after discussing briefly other possible procedures and laying before you the clinical evidence and statistics which have been gathered in regard to castration up to the present time. This table,¹ which I have compiled from the reports of considerably over one hundred operations, is at your service and may be looked over hereafter at your leisure. A careful study of it will amply justify my statement that the degree of relief experienced and the percentage of cases that may fairly be called "cures" by the performance of castration are far in advance of the results obtained by any other method of treatment.

I will speak briefly of the other methods which are employed in the treatment of prostatic enlargement, and the procedures appropriate to the various conditions and stages of hypertrophy.

1. *Dilatation* may be appropriate in the early stages of hypertrophy when the symptoms of prostatic-vesical congestion are present; where the patient is disturbed only once or twice during the night; where the enlargement is of moderate density, appreciable through the rectum, but not offering much resistance to the introduction of an ordinary catheter, and when there is little residual urine.

In this condition the systematic introduction of full-sized steel sounds seems to relieve existing symptoms, and to prevent or at least delay the development of further trouble.

While this method of treatment affords relief, no more radical measure should be thought of.

¹ See table in *Annals of Surgery*, July, 1895.

2. *Catheterism*.—This should be systematically employed in those cases where the quantity of residual urine is three ounces or more, and in which the introduction of the instrument is easy and painless and the urine is sterile.

A good working rule to regulate the frequency of catheterization, when the urine is sterile, is to use the catheter once daily (preferably at bedtime) for three ounces, twice for six ounces, and then once more for each additional two ounces. It is seldom necessary to catheterize oftener than once in four hours when the urine is sterile.

In the majority of cases these two procedures will be found to be merely palliative measures; as a rule, the introduction of instruments gradually becomes more difficult and cystitis and atony of the bladder result from the catheterism, which increases in frequency and painfulness, until an operative procedure must be considered.

But I may say that in those patients with but moderate obstruction, or with a high grade of compensatory hypertrophy of the bladder, with a small amount of residual urine, which remains sterile, and in whom catheterism is easy and painless, operation is not to be thought of.

3. *Overstretching of the prostatic urethra* may next be considered. When the median lobe of the prostate and the vesical neck are chiefly concerned this procedure is not likely to be followed by good results; but in those cases of lateral hypertrophy in which the urethra is simply narrowed and rendered tortuous, it might be of use. When tried, the operation should be performed under ether, and should be carried to the furthest degree consistent with safety. This operation might be indicated in those cases where palliative measures have failed and more radical treatment has been refused. But its results are doubtful, and nothing like a cure could be anticipated. There should, of course, be almost no mortality.

4. *Perineal prostatotomy* may now also be said to have its proper place among palliative operations. With prolonged drainage or the formation of a permanent fistula this operation often relieves cystitis and will sometimes effect a cure.

But in the majority of cases the fistula must be kept open throughout life, and many times the wound will refuse to close when it is desired to have it do so. The mortality of this operation is only about four and a half per cent.

But when we consider the inconvenience of this condition, and the undoubted risk of renewed vesical infection attending a permanent fistula (which often suppurates continuously), it seems to me to compare very unfavorably with the results obtained in the average case of castration.

The mortality of castration would probably be less and its results, as regards re-establishment of function, better than those of perineal prostatotomy, when performed under the same circumstances.

5. *Suprapubic cystotomy with prolonged drainage or with the formation of a permanent fistula*, aside from the "sentimental" objection, I believe has little to be said in its favor in comparison with castration.

It has a mortality slightly greater than the perineal operation, gives equally good drainage when properly performed, and has the advantage of permitting a more thorough exploration of the bladder and of being converted into a prostatectomy if the condition warrant it.

But it offers no prospect of cure, is altogether inapplicable to cases with small rigid bladders, and, even with the most ingenious apparatus and modifications of the operation, the patient's person and clothing are apt to be urinous and offensive, and there are many minor inconveniences.

6. *Perineal prostatectomy* has a mortality of fourteen and three-tenths per cent. The principal clinical indications for this operation are about the same as those which I have already mentioned as justifying prostatotomy.

Its chief objection as a radical measure is that in only about one-third of the cases can the growth be reached by the finger of the operator; that often, even when accessible to the finger, it cannot be satisfactorily dealt with through the narrowed urethra; and that vesical projections are altogether beyond reach for accurate or careful manipulation.

Both on account of the mortality and the comparative uncertainty of its results, I think this operation will not often be weighed in the scale with castration.

7. *Suprapubic Prostatectomy*.—Formerly this operation was to be performed in all those cases in which, palliative treatment having failed, there was unmistakable indication that the local conditions were growing worse, while the general health still remained unaffected.

For this operation the best possible period is that before the development of marked and continuous cystitis, while some power still remains in the vesical walls, and the bladder is neither thinned and dilated, nor rigid and contracted.

I have held in the past that under these circumstances, in the case of a patient who reports that he is disturbed at night with increasing frequency; that he is obliged to use the catheter oftener, and not only does so with greater discomfort, but with less relief in the intervals; that the urine is occasionally turbid and offensive; that he has had one or more attacks of retention, and that he is beginning to lose flesh and

appetite; I have held, I say, that the indications for operative interference appeared unmistakable, and that the suprapubic method seemed obviously the one to be selected.

To-day, however, I believe that the choice of operation no longer lies in favor of suprapubic prostatectomy. Since I ventured to introduce the operation of castration for this condition of the prostate it has been performed with constantly increasing frequency, until now I have the statistics of considerably more than a hundred operations. From my own experiences, and from those of others which make up the number of operations to which I have just referred, I believe that its advantages over suprapubic prostatectomy, its most formidable rival, are manifest.

Comparing now suprapubic prostatectomy with castration, the advantages of the latter are as follows:

(1) The mortality of the first extensive series of prostatectomies published was twenty-five per cent. The mortality of the operation of castration, which includes a slightly larger number of cases, and takes into account every known death, even when it occurred months after the operation, is eighteen per cent.

Among these operations a number have been performed in the last extremity,—where there has been almost no hope of saving the patient, but simply to give the man the benefit of whatever chance might possibly exist. Throwing out these cases, which would be only fair and just, since it is unreasonable to expect results from any operation which is performed when the patient is almost moribund, the mortality would be but seven and one-tenth per cent. I believe the mortality will be even less than this in the future, for it has been so in the history of every new operation introduced into surgery. Castration is a simple, easy, rapid procedure, without danger *per se*, and requires for its safe performance only a proper selection of cases.

(2) In the successful cases the return to local and general health has been more complete and vastly more rapid than after prostatectomy. Within from four to twelve weeks a re-establishment of almost perfect health has occurred in fifty-one and two-tenths per cent. of the cases.

(3) After castration vesical contractility was re-established, cystitis disappeared, and all pain ceased in a very large proportion of the successful cases; and it is unlikely that any operation which opens the bladder and necessitates healing by granulation will secure equivalent results,—certainly suprapubic prostatectomy has failed to do so.

(4) Suprapubic prostatectomy may be followed by a permanent

fistula, which proves a continual source of annoyance, even when all other results have been favorable.

These I consider the more important advantages which castration possesses over the suprapubic operation, though I might mention one or two other additional minor ones.

Unilateral castration, ligation of the vascular constituents of the cord, and ligation of the whole cord have all been tried, but have so far failed entirely to give such satisfactory and reliable results as the removal of both testicles.

Without being able to take the time to discuss the subject more fully, or to quote statistics which I might furnish you more extensively, I may say that the summary of the conclusions at which I have arrived, and which the arguments which I have already set before you in part, warrant, are as follows:

(1) The function of the testis, like that of the ovary, is twofold,—the reproduction of the species, and the development and preservation of the secondary sexual characteristics of the individual. The need for the exercise of the latter function ceases when full adult life is reached, but it is possible that the activity of the testis and ovary in this respect does not disappear coincidently, and that hypertrophies in closely-allied organs like the prostate and uterus are the result of this misdirected energy. This hypothesis would increase the analogy between the fibromyomata of the uterus and the adenofibromata of the prostate, which, from a clinical stand-point, is already very striking, and is further strengthened by the almost identical results of castration in the two conditions.

(2) The theoretical objections which have been urged against the operation of double castration have been fully negatived by clinical experience, which shows that in a very large proportion of cases (thus far in approximately eighty-seven and two-tenths per cent.) rapid atrophy of the prostatic enlargement follows the operation, and that disappearance or great lessening in degree of long-standing cystitis (fifty-two per cent.), more or less return of vesical contractility (sixty-six per cent.), amelioration of the most troublesome symptoms (eighty-three per cent.), and a return to local conditions not very far removed from normal (forty-six and four-tenths per cent.) may be expected in a considerable number of cases.

(3) The percentages of the total number of deaths in the one hundred and thirty-five operations from which I have now been able to gather statistics is seventeen and nine-tenths. But of these there seem to be twenty-four that may fairly be excluded in an attempt to

ascertain the legitimate mortality in patients operated upon under surgically favorable conditions,—*i.e.*, before the actual onset of uræmia, or, better, before the kidneys have become disorganized by the two factors rarely absent in advanced cases,—backward pressure and infection. This would leave a mortality of six and six-tenths per cent., which will probably be decreased as advancing knowledge permits of a better selection of cases. It is important to note that even in the desperate cases which make up the series of deaths seventy-five per cent. showed an improvement of the symptoms or shrinkage of the prostate before they died.

(4) Comparison with other operative procedures seems to justify the statement that, apart from the sentimental objections of aged persons, on the one hand, and the real, entirely natural, and very strong repugnance to the operation felt by younger patients, castration offers a better prospect of permanent return to normal conditions than does any other method of treatment. The relatively greater degree of improvement in successful cases should be considered, as well as the mortality, in comparing the operation with the various forms of prostatectomy and prostatectomy. So, too, should the absence of any risk of permanent fistulæ, peritoneal or suprapubic; the ease and quickness with which it can be performed; and the possibility of avoiding altogether the use of anæsthetics, which in these cases are in themselves dangerous.

(5) The evidence as to unilateral castration is at present contradictory, but there can be no doubt that in some cases it is followed by unilateral atrophy of the prostate, and in two cases at least it has resulted in a very marked improvement in the symptoms. It is worthy of further investigation.

(6) My experiments on dogs have shown in nearly every case in which the *vas deferens* was tied or divided on both sides that, without much change in the testicles, there were beginning atrophy and considerable loss of weight in the prostate. These experiments need repetition and confirmation, as the absence of corresponding testicular change seems to make the results somewhat anomalous. It is possible that the incision or severance of small but important nerves may account for the effect on the prostate.

(7) Ligation of the vascular constituents of the cords produces atrophy of the prostate, but, in my experience, only after first causing disorganization of the testis.

[Dr. White then performed a double castration, the entire operation occupying two and a half minutes.]

A CASE OF GONORRHœA FOLLOWED BY ECTOPIC PREGNANCY AND PYELITIS.

CLINICAL LECTURE DELIVERED BEFORE THE STUDENTS OF YORKSHIRE COLLEGE.

BY MAYO ROBSON, M.D., F.R.C.S.,

Professor of Surgery in the Yorkshire College; Hunterian Professor, R.C.S. (Eng.); Senior Surgeon to Leeds General Infirmary; Honorary President of the International Congress of Gynaecology.

GENTLEMEN,—I have on many occasions, both at the bedside and in the systematic course of surgery at the college, pointed out to you that the ordinarily accepted estimate of the importance of gonorrhœa is by no means a correct one, and that what is often looked on as a trifling ailment, the treatment of which may be lightly undertaken by the prescribing chemist or the venereal quack doctor, is, because of its troublesome sequelæ, one of the most serious of diseases, which may, however, be robbed of many of its terrors if properly treated in its initial stages.

The reason why I have selected this as my subject to-day is that in my women's ward, No. 8, there is one of the best examples you could possibly find of a patient whose life has been utterly wrecked by a series of complications of the most serious character; for the poison has not only followed the genital mucous tract from the vagina through the uterus and tubes to the ovaries and peritoneum, but has also passed backward through the urethra, bladder, ureters, and kidneys, besides affecting the blood generally, producing articular trouble and general cachexia.

The history of the case—for the notes of which I have to thank my house surgeon, Mr. J. W. Trotter—is as follows:

Mrs. V., aged twenty-eight, married, was admitted to the infirmary on November 18, 1896, complaining of pain in the lower abdomen and pelvis, and a scalding pain on micturition.

She gave the history of painful and excessive menstrual periods, and had suffered from "whites" for six years.

She had had frequency of micturition with scalding for six years. Her present acute illness dates from six weeks before admission, at which time she had a sudden attack of pelvic pain, accompanied by pallor and faintness. She had missed the previous period, the attack taking place six weeks after the last menstruation. After this attack the scalding pain and the frequency of micturition increased to seven or eight times a day and several times during the night, the urine becoming thick and offensive. The vaginal discharge became more offensive and more abundant, and was mixed with blood. Along with this she had severe "bearing-down" pains.

On admission she presented a pale and weakly appearance, and looked very ill. Abdominal palpation revealed a hard and fixed mass in the hypogastric region, the upper border being easily defined, and on a level with the anterior superior spine of the ilium. The right border of the swelling was a little to the right of the middle line, the left border two inches from the middle line. Below it appeared to extend into the pelvis. The swelling was only slightly tender.

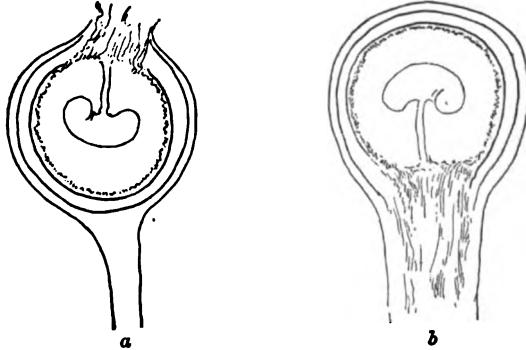
On vaginal examination the os uteri was patent, and the body could be distinguished pushed over to the right. On the left was a large swelling, feeling hard, but doubtfully fluctuating. By rectal examination the mass was felt in front of the bowel.

The urine was acid, and contained a quantity of pus. A diagnosis of pelvic haematocele, the result of a ruptured ectopic pregnancy, was made, and the patient was kept at rest in bed. Her condition improved during the following month, but at the end of this time a vaginal examination showed that, though the haematocele on the left side had almost disappeared, there was left behind a soft, fluctuating swelling. This was diagnosed to be a distended tube, the site of an extra-uterine gestation, and on account of the rapid increase in size of the tumor and the patient feeling faint, the operation was hastened.

During the month between admission and operation the temperature had never been much above the normal. On December 19 an abdominal section was performed. The right tube was occupied by a haematosalpinx the size of a hen's egg. This was removed. On the left side was found a large, thin-walled, purple, and rather hard tumor, which was adherent in the pelvis. This was found to be the left tube; this also was removed, when it was found to measure four by three inches, the long axis lying nearly vertical. It was full of clots and placental tissue, though no foetus could be discovered. The patient progressed satisfactorily, the wound healing by first intention and there being no rise in temperature. However, on January 3, the thirteenth

day after the operation, the temperature rose to 100° F., and continued between 99° and 100° during the rest of the time the patient was in the hospital. At this time the pus in the urine, which had somewhat diminished in amount since her admission, became much more profuse, without any apparent cause, as no catheter had been used and the patient had been lying in bed all the time. On January 8 the urine became very alkaline, and contained much pus. She had now lost her appetite, and was looking very ill, having occasional chilly attacks but no actual rigor. Her most prominent complaint was pain in the left loin, which gave rise to the suspicion of suppuration going on in the left kidney, although on palpation nothing positive could be felt. She remained in this condition till February 1, when at her own request she returned home. While in the hospital, washing out the bladder

FIG. 1.



Diagrams showing (a) rupture of the Fallopian tube into the peritoneal cavity and (b) into the broad ligament, as in the case under consideration.

was tried, but, as it increased her vesical irritability, it was discontinued. Salol and quinine, liq. santal co., santal oil, etc., were tried, but without material benefit.

She was readmitted on April 11, with severe pain in the left loin, where a distinct tumor could be felt. She looked almost moribund, extremely pale, wasted, listless, and almost too weak to turn in bed. The pain in the loin was constant, with exacerbations of a shooting character. Micturition occurred every three or four minutes, accompanied by acute pain. The urine was alkaline, and contained a very large quantity of pus. Renal abscess was diagnosed, and on April 16 an incision was made into the left kidney, when a large quantity of stinking pus was evacuated, and free drainage adopted. The improvement in her temperature and in her general condition was very marked after the nephrotomy, though the scalding and painful mictu-

rition persisted. Slow improvement continued till June 2, although during this time the patient had frequent vomiting attacks with occasional rises of temperature. On June 2 the pain on the left side again became very severe, the temperature rising to 100.5° F. On June 3 both knees became much swollen, hot, and very tender, while the following day the elbows and shoulders were attacked in the same way. On June 9 a painful swelling of Bartholin's gland developed, which was incised and found to contain a yellow, glairy fluid. The joint affections cleared under salicylate of soda and had quite disappeared by June 23. The patient has slowly improved, and at present her arthritic troubles have completely disappeared. Though there is still pus in the urine and some discharge from the lumbar sinus, the temperature is normal, and her general condition is improving under the administration of a tonic containing iron with good food and careful nursing.

It needs no words of mine to amplify this terrible picture of misery and distress caused by a preventable disease, which, moreover, if unfortunately contracted, is, as a rule, easily cured if treated vigorously at its commencement. It is, I think, clearly established that gonorrhœa is due to an infection of the mucous membrane by a diplococcus, "the gonococcus." This germ grows in the epithelium and spreads by continuity along the mucous channels, destroying the protective layers of epithelium and laying bare the lymphoid structures, which are thus directly exposed to infection by the pus microbes, micrococcus pyogenes aureus and albus with other germs of a like nature. Thus all well-marked cases of gonorrhœa are examples of mixed infection, and in all probability the gonococcus plays the part of a key, opening the door to these other infections, though it also probably creates a ptomaine producing constitutional symptoms.

To describe to you in detail all the complications and sequelæ of this dire disease would be impossible in one lecture; hence I will simply mention the complications special to each sex and those common to both sexes, dwelling in detail only on the special complications which the patient we have just seen has had and is now suffering from.

SPECIAL TO MALE.

Chordee.	Abscess of prostate.
Phimosis.	Vesiculitis.
Balanitis.	Epididymitis.
Cowperitis.	Orchitis.
Prostatitis.	Stricture.

SPECIAL TO FEMALE.

Inflammation of Bartholin's gland.	Hydrosalpinx.
Vaginitis.	Hæmatosalpinx.
Ulceration of vagina.	Extra-uterine gestation.
Endocervicitis.	Hæmatocoele.
Endometritis.	(a) Extraperitoneal. (b) Intraperitoneal.
Metritis.	
Salpingitis.	Puerperal septicæmia.
Pyosalpinx.	Adherent placenta.
Ovaritis.	

COMMON TO BOTH SEXES.

Urethritis.	Peritonitis.
Urethral abscess.	Proctitis.
Cystitis.	Sterility.
Ureteritis.	Gonorrhœal arthritis or rheumatism, with its complication,—ankylosis of joints.
Pycititis.	Pyæmia.
Surgical kidney.	Gonorrhœal ophthalmia.
Perirenal abscess.	Iritis.
Uræmia.	Neuritis.
Retention of urine.	Myelitis.
Suppression of urine.	Ulcerative endocarditis.
Pelvic abscess.	
Adenitis of inguinal glands.	
Bubo.	

This list of complications and diseases directly due to gonorrhœa is not imaginary or suggested, for I believe there is not a single one mentioned that I have not personally seen.

To return to our case: when I first saw her she gave a clear history of gonorrhœa, followed by salpingitis. As a rule, the damage to the tubes leads to sterility, owing, first, to desquamation of the ciliated epithelium, and, in the second place, to inflammatory and subsequent cicatricial stenosis of the tubes. Sometimes, however, the tubes are left patent, though the epithelial lining is destroyed, and that was probably the case in this instance. When the tube is denuded of epithelium, but the lumen remains patent, it is possible for the ovum to be arrested and impregnated in any part of the tube, where its subsequent development may lead to one of the numerous complications shown on the appended chart. (See page 199.)

In Mrs. V.'s case the history of a missed period, then of acute pelvic pain accompanied by faintness, and on examination by the presence of a swelling on the left of the uterus, led to a diagnosis of hæmatocoele due to the rupture of a tubal pregnancy, and the limitation of the hemorrhage led to the belief that the pregnancy was in the

Schemta of Ectopic Gestation.

I.—Ovarian (not proved).

II.—Tubal.

In outer third.	In middle third.	In inner third,—that is, within the wall of the uterus; tubo-uterine or interstitial.
All the varieties which occur in the middle third of the tube, except rupture into the broad ligament.	Abortion through open end of tube into peritoneum or into ovarian hydrocele; ending in recovery or in death from hemorrhage or peritonitis (hemato-salpinx).	
Primary rupture into peri-tonium, and death from hemorrhage before twelfth week unless surgically treated.	Very early primary rupture; moderate hemorrhage. Recovery not proved, but probable.	May rupture into peritoneum, causing death by hemorrhage in the eighth to the twentieth week.
Hematocele of broad ligament and death of ovum. Recovery by absorption.	Primary rupture into abdomen, with subsequent suppuration and peritonitis.	May rupture into uterine cavity and be discharged per vaginam.
Permanent lithopedion, which may remain quiescent.	Rupture into broad ligament.	Very early spoplyx, and death of ovum without rupture (hemato-salpinx).
Lithopedion suppurating after remaining quiescent for years, leading to serious disturbance, and death if not removed.	Rupture into abdomen: limitation of bleeding by matting of intestines.	Questionable if ever goes to full time in uterus—that is, after primary rupture.

middle third of the left tube, and that the rupture had occurred in the lower part of the tube embraced by the mesosalpinx (see Fig. 2).

As the patient was progressing satisfactorily as far as the tumor was concerned, absolute rest was enjoined, in the hope that the effused blood would be absorbed completely, and at the same time the foetal struct-

FIG. 2.

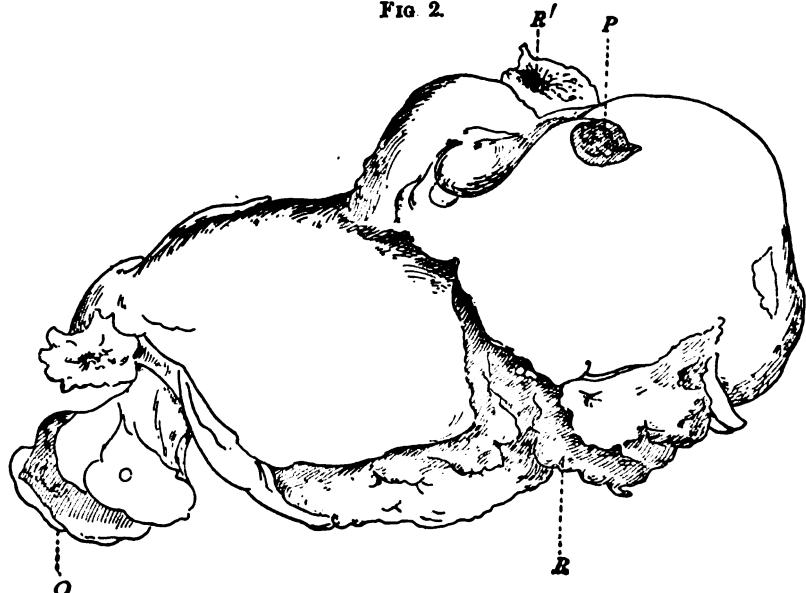


Diagram of a case of ectopic pregnancy, showing the ovary (O), its relation to the pedicle at the proximal end of the Fallopian tube (P), and the sites of the primary rupture (R) and secondary rupture (R').

ures would disappear, and treatment was directed to the cystitis, which had throughout been so troublesome. The increase in the pelvic swelling on December 18, associated with faintness and further pelvic distress, pointed to a secondary rupture of the sac,—in other words, to a giving way of the peritoneal covering which was limiting the effusion of blood,—thus making an extraperitoneal haematocele intraperitoneal, though the pelvic adhesions which had previously formed prevented a general flooding of the peritoneum with blood, as occurs in those cases where the rupture is primarily on the convexity of the tube.

It is interesting to note that, although the cystitis and pyelitis were continuing, the progress after abdominal section was uncomplicated, and the wound healed soundly, just as we are accustomed to see in otherwise healthy persons.

The operation of nephrotomy gave such marked relief that it seems unfortunate that it was not performed earlier; the reason of this delay was that the patient was wishful to avoid further operative treatment, and left the hospital, only to return when it was quite evident to her and her friends that she must die shortly if unrelieved.

The method of inserting two parallel tubes into a foul suppurating cavity enables the abscess sac to be irrigated with a continuous stream of mild antiseptic lotion at each dressing without making tension or forcibly distending the sac, as must be the case when only one tube is used and a lotion is forced into the closed cavity.

The suppuration in Bartholin's gland and the ulceration of the vagina were both apparently due to the common cause. The ulceration was so extensive that it is not unlikely that stricture of the vagina may follow. These complications call to mind Cowperitis and stricture of the urethra in the male.

Fortunately septicæmia and pyæmia have been thus far avoided, but constitutional effects in the shape of gonorrhœal rheumatism in the knees, ankles, and hips have occurred, and have added not a little to the distress of the patient.

We hope to send her to a convalescent home shortly, but there must of necessity be a long period before convalescence is fully established and before the patient can be considered safe from relapse.

Treatment.—For obvious reasons, the treatment of gonorrhœa in the male and female has to be conducted on different lines, for, in the first place, the disease is at once recognized in the male, and as a rule vigorous treatment can be adopted, and the extension of the inflammation backward arrested, whereas in the female, the onset being less acute, and the urethra often not participating in the trouble at the outset, the vaginitis is allowed to pursue its course, and to invade the uterus and tubes before treatment is sought; but even if the urethra be attacked early, and attention be thus drawn to the ailment, the disease speedily reaches the bladder, and then not infrequently the true cause is unsuspected. Even if recognized, it is frequently impracticable to follow it up so as to thoroughly cure it.

Although one cannot believe it to be quite true, as argued by some writers, that when once a woman is infected by gonorrhœa she never completely gets rid of it, it is an undoubted fact that in some cases the disease may recur without reinfection, and that in many cases it continues in a latent form for years, ready to be lighted into activity in a variety of ways.

In men this is shown by a gleety discharge, which readily becomes

purulent after alcoholic or other excess, without the possibility of re-infection.

If a case be diagnosed early, rest should be urged, and a one-in-two-thousand warm perchloride of mercury solution should be used as a vaginal douche night and morning for several days, after which a warm boracic douche should be employed night and morning for several weeks.

At the same time sandal oil should be administered in capsules three or four times a day, as this is excreted through the kidneys, and has a specific effect on the mucous membrane of the bladder and urethra.

The bowels must be regulated by some simple saline aperient, and the diet should be simple, stimulants being avoided and nitrogenous food being limited.

If the disease has invaded the womb, it will be advisable to dilate the cervix, and to curette it and the interior of the uterus, afterwards washing it out with perchloride of mercury solution, and then applying iodized phenol.

If the tubes have been invaded and pelvic peritonitis develop, absolute rest, with hot douches and warm applications to the lower abdomen, will be indicated, and opium may be required to alleviate the pain, which is often considerable. Under this treatment resolution will often occur, for the peritonitis in these cases tends to be limited by adhesion, and not to invade the general cavity of the peritoneum.

Should pus form in the tubes and a pyosalpinx develop, the removal of the pus-containing cavity will be advisable; for, though I have known the abscess to discharge itself through the uterine end of the tube, and complete recovery to follow, this course cannot be relied on, and the old axioms of surgery apply here as elsewhere, since it is more than probable that, if left, the abscess may burst into the bladder or into the bowel, or possibly into the peritoneum. All of which accidents I have seen happen, and some of them you have seen me operate for.

**TUBERCULOSIS OF THE BLADDER; FEMORAL HER-
NIA; TUBERCULOSIS OF THE SACRO-ILIAC
JOINT; CYST OF THE SPLEEN; STAB-WOUND
OF THE ABDOMEN, WITH GANGRENOUS AP-
PENDICITIS; CARCINOMA OF THE BREAST;
TUBERCULOSIS OF THE CERVICAL GLANDS;
LYMPHANGITIS; MASTITIS; FRACTURE OF
THE SCAPULA.**

CLINICAL LECTURE DELIVERED AT RUSH MEDICAL COLLEGE

BY JOHN B. HAMILTON, M.D., LL.D.,

Professor of the Principles of Surgery and Clinical Surgery in Rush Medical
College, Chicago, Illinois.

TUBERCULOSIS OF THE BLADDER.

GENTLEMEN.—The first patient I present to you this afternoon complains of some bladder difficulty. He is obliged to urinate frequently. I have not examined him, but will do so now in your presence. He is forty-one years of age, and a miner by occupation. He says he experiences pain when he passes water, and has to get up several times during the night. The physician who sent the case here informs us that no pus or albumen has been found in the urine. You will notice that the sound passes without difficulty. As the point of the instrument touches the prostate there is great pain, causing an outcry on the part of the patient. I will now, while the sound is in the bladder, pass a finger into the rectum for the purpose of determining approximately the size of the prostate and exploring the bladder. In the case of a bladder tumor, for example, we could determine by rectal exploration if the bladder were fixed to the pelvis or not. If this is the case, we should have reason to suspect malignancy of the growth. We have no history of blood passing with the urine, so that a bladder tumor is not here suspected. I now pass my finger into the rectum, with the sound in the bladder, and am enabled to measure approximately the

thickness of the bladder walls. I now turn the instrument over, so that its beak rests upon the bladder just behind the prostate. I withdraw it so as to make firm pressure against the prostate; if a stone is present it can usually be felt. I find a little abnormality—in the tenderness of the prostate—this tenderness being due doubtless to cystitis alone. I find on moving the sound over the bladder roughness of the posterior wall, which is rather suspicious when we take into consideration the slowness with which these symptoms come on. The patient tells us he has not lost flesh. The prostate is not very much enlarged, but simply tender and in a state of incipient inflammation, undoubtedly due to cystitis. We must remember that certain chronic affections of the bladder, such as tuberculosis, may present precisely these symptoms, and when you pass the beak of the sound along the posterior wall of the bladder you will encounter the roughness characteristic of ulceration, and especially in the vicinity of the ureter. Sometimes tuberculosis of the bladder is a secondary affection, and I believe in the majority of cases it will be found to be secondary to tuberculosis of the kidney of one side or the other, the larger proportion of cases being on the right side. Palpation of the kidney usually gives us some information in these cases, and especially repeated examinations of the urine. I do not think a single examination of the urine is enough to give us definite information in these cases; it should be examined repeatedly, for we are not certain as to its condition at all times, bearing in mind that it may vary on account of the food that is taken; that is, the constituents of the urine vary as much as the quantity of it, so that in order to make an accurate diagnosis of the condition of the urine formed by the kidney we must make repeated examinations, as much as five or six examinations being required to determine that point. Palpation should be performed by taking the fingers of one hand and applying them firmly in the lumbar region, beneath the twelfth rib, pressing in the direction of the kidney, while with the other hand we press the kidney between the two fingers, and if there is much tenderness or enlargement, or if the kidney is floating, it can be detected by palpation in that way. Now, when we find such a condition of the bladder in connection with tenderness of the kidney, a diagnosis of tuberculosis of the bladder is probable. After having had recourse to repeated and careful irrigations of the bladder without lessening the pain, and after excluding tumor, I should naturally be inclined to the inference that we have to deal with a case of tuberculosis, and usually, as I have previously remarked, the tuberculosis is secondary.

Now, with reference to this case, nothing is to be gained by opera-

tion, except when great tenesmus is present. In cases where the tenesmus is severe, and the tendency to urination is strong and frequent, I would perform either perineal section or suprapubic cystotomy, depending, of course, upon the nature of the case and the physical condition of the patient. In a fat patient, I should be inclined to do a perineal section rather than a suprapubic cystotomy, on account of the depth of the incision necessary to reach the bladder, and the better drainage which is afforded in cases of perineal section. The latter procedure is preferable to suprapubic cystotomy where it is done for the purpose of drainage alone. Patients recover better after it, and the subsequent history is more favorable than where a suprapubic operation is performed.

With reference to castration as a remedy for prostatitis, we must remember that, although there seems to be an intimate connection between the vesiculae seminales and the prostate, yet it is only fair to say that the disease must be limited to prostatic disease in order that castration shall be of advantage, and in such a case the less radical operation of excision of the vas deferens is to be preferred. When we have, as in this case, a surface extending over the posterior wall of the bladder which is roughened to the extent of an inch and a half, tender to the touch, and which shows no signs of thickening of the bladder, in such a case castration would be useless. It would not only be useless, but cruel to perform an operation from which no benefit was to be gained. In the case of a very old man with very much enlarged prostate, where the prostate itself interferes with urination as much by mechanical obstruction as by other means, in such a case castration or excision of the vas deferens affords probably the best remedy that is known at the present time. In other cases of prostatic engorgement and inflammation it is well first to try irrigation twice a day with a weak solution of boracic acid, washing out the bladder thoroughly, before resorting to operative procedures. I would recommend that that be done in all such cases in which there is no positive enlargement of the prostate, but where it is simply tender and the disease confined to the mucous membrane itself. That I conceive to be the condition in this case, with a strong probability that we have to deal with a specific disease due to tubercle bacilli rather than to a non-specific disease of the bladder.

FEMORAL HERNIA.

We have a case here in which a diagnosis of femoral hernia has been made. A truss has been worn by the patient, and as a conse-

quence the parts are much irritated. She purposes coming into the hospital for relief. I recommend all such patients to undergo an operation for the radical cure in preference to wearing a truss. Femoral hernia affords even better results than inguinal hernia after operative procedures. The wound heals kindly, and if the catgut used be thoroughly aseptic, or if the silver wire, or gold wire which was used many centuries ago for this purpose, be employed, the cure is absolutely perfect. I do not think any one is at all at fault in promising a radical cure in cases of femoral hernia where the sac is not too large and where there are no complications to militate against a prompt recovery.

TUBERCULOSIS OF THE SACRO-ILIAC JOINT.

We have before us one of those curious and, until a comparatively recent period, unrecognized forms of tuberculosis. The patient has suffered for many months with pain posterior to the hip-joint, which is not particularly increased on motion of the joint, but is increased on motion of the whole lower portion of the body. I find that making sudden pressure against the foot, so as to drive the head of the femur against the acetabulum, does not increase the pain. Furthermore, if we take care so that when the leg is flexed the muscles are not involved in the rotation, we do not produce pain at the joint. Trochantero-iliac measurements show that there is no difference between the arc of motion on one side and on the other. There is no difference in the tension of the fascia lata on one side or the other. It shows that the disease is not in the femoro-acetabular joint. When I seize the pelvis, grasping firmly the superior spine of the ilii on either side, I find the pain becomes acute; by lifting on the pelvis, I increase the pain, and a turning motion of the body influences it. This joint is seldom recognized as a joint, but it is always used in the turning of the body on the vertebral axis, and it is here the seat of the disease. Taken in connection with the long period of time that has elapsed since the appearance of the disease, and the exclusion of other affections sometimes encountered in the vicinity, we narrow our diagnosis down to the sacro-iliac joint as being the seat of the disease, and as it is chronic in its character, it follows there can be, from the clinical history of the case, but one diagnosis,—that is, disease of the sacro-iliac joint, probably tubercular.

The treatment of this affection consists in making a posterior operation for the purpose not only of evacuating any pus which may be present, but for applying direct medication to the joint and affording perfect drainage. So then we make an incision over the joint,

deep down in the muscles, quite to the bone, working behind the peritoneum. We reach the ilium, push the muscles to one side, and come upon the bone. Then with chisel and mallet a fenestrum is carefully cut through the joint, being careful not to cut deeply into the pelvis and wound the pelvic viscera. For posterior drainage, after making an incision through the skin at the sciatic notch near the tuberosity of the ischium, we can pull our drainage material through with forceps. For the purpose of drainage in these cases Sayre, many years ago, used a "rope" of oakum. More recently surgeons use a strip of iodoform gauze, which is the most common form of drainage at the present time. The use of rubber tubes, or even the metallic tubes of Chaissagnac, have been abandoned as a first drainage. The majority of surgeons, I think, to-day use iodoform gauze as drainage material at the time of operation. If, now, in cutting into this region we should be fortunate enough to strike the exact seat of the disease or abscess, deeper drainage would no longer be necessary, but in the majority of cases, remembering that this auricular articular surface is from two and a half to three inches long, we may escape striking the exact spot where pus has formed. In the generality of cases we establish as thorough drainage as possible, using iodoform emulsion or other chemical germicides by injection, to cure the patient. One thing is to be said in relation to this subject, and that is the operation itself is generally followed by cessation of pain, even if pus is not encountered at the articular surface. The bone seems to be osteoporotic, indicating the existence of an inflammatory process within it.

I have now, with some difficulty, pushed the forceps through in the line of the articulation. We are entirely behind the peritoneum, and I have kept the forceps close to the bone. We will now be able to inject chemicals so as to reach the seat of the disease. We will insert a couple of stitches in the upper end of the wound to shorten it, and then we will be ready from time to time to inject iodoform emulsion, or whatever disinfectant we may choose to use. In a few days we may with benefit change the gauze to rubber tubing.

You will notice that we have the drain extending to the lower part of the body, so that after a few weeks, probably a few days, when the patient is able to sit up, she will have the force of gravity to assist drainage, and we can change the drain from time to time.

TUBERCULAR CYST OF THE SPLEEN.

We have here a very interesting case of abdominal tumor about which there seems to be more or less doubt, and yet, at the same time,

by exclusion, we can arrive at an approximately correct diagnosis. The tumor seems to be solid at certain parts and fluctuates at others. The use of the aspirator gives exit to a bloody fluid. As I pass the needle of the aspirator into the tumor about half a pint of bloody fluid gushes out. It is not deeply colored like pure blood, but is the color of the contents of a serous cyst into which a hemorrhage has occurred. From what viscus did this tumor start? It is comparatively free on the right side of the abdomen. If I try to map out the edge of the tumor and resort to percussion and palpation—palpation here gives us the best result as to location—I find that notched appearance characteristic of splenic tumor. The upper end of the tumor is pretty solid; it seems to spring from underneath the ribs; it extends backward towards the spine; anteriorly it extends to the stomach. I am inclined to believe that we have here a rare form of cyst of the spleen; but, at the same time, it is proper to say that the differential diagnosis between a cyst of the spleen and of the kidney by external examination is not easy to make. Microscopical examination of the fluid from this cyst shows nothing but blood-corpuscles. Usually, when we have a splenic tumor of this size the functions of the spleen are disturbed, and we have leukæmia; but there is no leukæmic blood in this patient. Sometimes we find those curious bodies known as filariæ, or we may find the hooklets of an echinococcus, but we do not find them here. Why do we exclude tumor of the kidney? I do not absolutely exclude it, because I think the knife will be able to settle that point. When we have an echinococcus cyst or hydatid of the kidney we find some evidences of it in the urine. In a case which I presented to the clinic a couple of years ago of hydatid of the kidney, we had a discharge of some of the sacs from the cyst, and on straining the urine, the hooklets were found by microscopic examination of the precipitate. There is nothing of that kind in this case. Furthermore, there has been no evidence of disease of the kidney. The urine has remained normal throughout the disease. I do not believe that such an extensive cyst of the kidney could manifest itself without some evidences of disease of the kidney itself. I am satisfied, in my own mind at least, that we have to deal with a cyst of the spleen. It is not a pancreatic cyst; the reason for that determination is found in the character of the fluid. When we have a pancreatic cyst we have to deal with a retention cyst of one of the pancreatic ducts which has dilated and become enlarged until it is filled with pancreatic fluid.

The fluid, which was evacuated from the tumor by aspiration, is not

pancreatic, and therefore we may exclude cyst of the pancreas. There is still another ground,—an anatomical reason; the point of attachment of this tumor seems to be farther down than would be the case were it a cyst of the pancreas.

The operative measure I would recommend in such a case as this would be simply to open the cyst, evacuate its contents, explore and find out the nature of the tumor, make it fast to the abdominal wall, and pack the cavity with iodoform gauze. The theory upon which the operation is done is this: In the first place, we wish to cut off the contents of the cyst from escape into the peritoneal cavity. So the first thing to be done will be to stitch the peritoneum to the skin in the wound before we open the cyst. Then, after opening the cyst we stitch its wall carefully to the peritoneum. If we have to deal with a cyst whose wall is as thin as paper, this procedure is not possible except by withdrawing the cyst and cutting it open, as the cyst wall will not bear the tension which the stitches will put upon it.

There is another class of tumor we may encounter, cysto-sarcoma, in which a cystic structure has been formed, not a true retention cyst, but as a matter of fact it is an enormous cavity covered with the capsule of the organ, caused by degeneration of the sarcomatous structure.

The incision in this case will not be made in the median line, but in the linea semilunaris. In order that we may keep close to the attachments of the cyst, and as the abdominal veins are quite prominent, they will be seized with forceps and tied. The abdomen is so distended that it is difficult to see, but we shall go directly through the wall carefully, because of the enormous tension here. We see in the incision a white, shiny, glistening substance, but we know that is not the cyst wall but the deeper muscular layer, on account of the density of its fibres. I now come upon a structure of quite a different character. I have cut through the peritoneum and now expose the cyst. I shall pick up the peritoneum with forceps and turn out its cut edges and then stitch them fast to the skin. To all appearances this tumor looks like a solid one, but you will remember the aspirating needle in passing through it seemed to go into a cavity. I have now stitched the peritoneum to the skin, and we are ready to see what is on the inside of this tumor. It is, perhaps, unnecessary to state that all hemorrhage should be stopped before we empty the cyst. Thus far only a few ounces have been removed of this bloody material. This might indicate that the cyst is a degenerated sarcoma.

I will now explore it a little further, as there is no danger of escape of the contents into the abdomen. The posterior attachments of this

tumor are such that it is not possible to remove them, in my judgment, without fatal hemorrhage. I shall not attempt it. But we will pack the wound with gauze so as to prevent any hemorrhage from it.

I am not able to say what this growth is. At one point it looks like lymph shreds which have been colored with bile, such as you find in inflammation of the gall-duct. At other points there is a cheesy substance which looks like broken-down tubercle. It will require the microscope to determine the nature of this case.

The treatment outlined in the beginning—namely, packing with gauze—will be carried out in this case. This tumor, so far as I can determine with my fingers, occupies exactly the position of the spleen, and seems to constitute the pulp of the spleen. I can feel the kidney intact behind it. You will notice now I have the cyst wall brought up fully into the wound; the peritoneum has been previously stitched to the skin, so it is out of harm's way. It cannot retract now. The next step of the operation will consist in clearing out this cyst cavity as thoroughly as possible, and then packing it.

I have, as you see, seized the edges of the incision with a padded forceps, so that I may not unnecessarily bruise the cyst wall, thus causing it to slough after the operation.

You notice how many fallacies there exist with reference to diagnosis. Even here, after I supposed I had demonstrated to my own satisfaction there was a cyst, by aspiration and by palpation, when we inserted the trocar there seemed to be a solid tumor, because the remaining fluid was too thick to flow, and yet, after all, it turns out to be a cyst of the spleen, as I can feel the kidney through the posterior wall in those portions of the tumor which seem to be more solid. I find it composed entirely of this mass (saw-dust-like material) which I scoop out with my fingers and which will require a microscopic examination to determine its character. I must confess, I have encountered nothing resembling it in my practice up to date. I shall now fasten the cyst wall to the skin and peritoneum and pack the wound with iodoform gauze.

Subsequent microscopic examination of the thick masses showed them to be broken-down tubercle.

[The patient lived about three months after the operation. Each day he became more and more emaciated and died of gradual exhaustion, with all the physical signs of general tuberculosis.]

STAB-WOUND OF THE ABDOMEN, WITH GANGRENOUS APPENDICITIS.

The next case we present to you was brought here by Professor Bevan, who will give us a report of the history of the case.

[PROFESSOR ARTHUR D. BEVAN: Saturday, about noon, this boy was stabbed with a pocket-knife. The stab-wound has healed externally. It is rather difficult to form an idea of the depth of the wound from the patient's description. He says that the knife was a small-bladed pocket-knife, about an inch and a half or two inches in length. He was stabbed in the lumbar region. Sunday morning, when he awoke, he felt pain in the right side. He has now a temperature of 102-3° F., great rigidity in the abdominal wall on the right side, and a distinct dull area in the position of the vermiform appendix. The condition of the patient is that of a typical case of appendicitis,—a dull area, pain in the region of the appendix, temperature, and some vomiting. There is, however, this history of stab-wound back of it, and I have been desirous of having Professor Hamilton give his opinion about it. The urine shows no evidence of blood; there has been apparently no injury of the kidney, although the site of the injury is in the lumbar region, where we might have injury of the kidney or ascending colon.]

PROFESSOR HAMILTON (resuming): Stab-wounds of the abdomen are not to be measured by the gravity of the apparent injury. I remember distinctly to have seen a stab-wound of the chest where a boy in a reform school had stabbed another boy with a narrow-bladed knife which extended between the ribs, and two days after the accident the boy was brought to my ward in the hospital. I discovered marked tympanites, such as we have here, with great pain and distress. On making an exploratory incision I discovered there was a wound of the diaphragm, and supposed that that necessitated opening the abdomen, and that the tympanites had resulted from a puncture of the intestine, or, at least, a wound of the intestine; but on opening the abdomen no wound of the intestine was found, but subsequently it was found that the pericardium had been hit by the point of the knife, and the diaphragm punctured. Strange to say, no blood-vessel was wounded, and there was very little hemorrhage except from one of the intercostal arteries which bled inside, and was believed to have been the absolute cause of death, although the wound of the pericardium might have caused it. In that case the external wound had almost healed.

Here we have a tense abdomen, especially on the right side, in the

region of the appendix. It is true we might have an appendicitis in this case *de novo*, independent of any injury, but I am inclined to think the symptoms from which the boy suffers at present are directly traceable to the wound. I base this opinion upon the results of clinical observation of some cases in which the results were much more severe than those of the original wound. We might find in such a case an enormous effusion of blood, but the condition of this boy does not seem to indicate it. His lips are ruddy; there are no signs of exsanguination, such as are shown when we encounter abdominal effusions of blood. I think there is no question, however, as to the existence of a local lesion at this point. We have, as has been stated, an area of dulness here of four inches or more, extending towards the navel, filling up the entire right iliac fossa down to Poupart's ligament. Posteriorly the bulging is not prominent, but there is a good deal of hyperæsthesia. The patient has had slight chills. (At this juncture the patient was taken to an adjoining room and prepared for operation.)

We will now perform exploratory laparotomy over the region of this tension. I shall make an incision to include McBurney's point directly along the linea semilunaris, nearly a straight line. You will notice that there is œdema, and as I open the peritoneum there is a gush of ascitic fluid and pus. It is faecal, showing that the intestine has been perforated. We will open the abdomen a little more freely. You will recall, if you please, what I said about not being able to judge of the character of a wound by its external appearance; that clinical observation showed that in many of these cases we have a far more serious wound than was apparent. But it may be that we have a perforation of the appendix irrespective of the stab-wound. I now raise the appendix, and you see it is gangrenous. The diagnosis of appendicitis is confirmed. The question is now, how far is this dependent upon the stab-wound? I have said there was no question about the propriety of immediate operation. We will now remove the appendix and investigate the condition of the wound a little further. I have now cut off the appendix, having tied it with a double ligature. You will see that it is gangrenous, and that perforation has taken place in it. We will later examine it carefully with a view to seeing whether or not it has been wounded. I touch the point of this stump of the appendix with pure carbolic acid, in order to cauterize it and prevent infection of the cavity, and we also cover the end of the stump with iodoform. If you desire further refinement as to asepsis, you can, as I do here, cover it with a stitch or two after inverting the cut edges; turning the mucous membrane interiorly we make a perfectly clean stump.

I take a fine catgut needle, the stump is held out, and I introduce the needle in the serous coat. I now turn the needle across to the other side, enter the serous coat, and will sew the stump on that side. I now bring the serous coats together, which can be done by a little tension on part of the stitch. We will now let the stump fall back into the cavity and see what is to be done with this blackened omentum here, which you see. It is practically out of the question to retain it with safety to the patient. So I will insert a suture here in the sound part of the omentum. I am quilting off the omentum now, which I propose to excise. I have now included it in a chain stitch, and will fasten the ends together.

I have noticed in the after-treatment, where the omentum has been excised, that there is apt to be more pain after the operation, but probably it has no other effect.

Inasmuch as this wound is so septic, it will be prudent to put iodoform gauze in it for a couple of days; and we will put in secondary sutures, so that we can stitch the wound at our leisure. One side of the colon, where it is attached to the mesentery, is so seriously involved in this inflammatory process that it has been thought best to pack the wound with gauze next to it and leave it unclosed, and simply have secondary sutures inserted, so that as soon as the gauze is removed they can be brought together and tied. This lower one will be tied now. Perhaps the upper end might be similarly tied; that will reduce the wound sufficiently to allow withdrawal of the iodoform gauze. If this appendicitis has no other connection with the stab wound, there is every reason to believe he will recover.

(This patient recovered in two weeks.)

CARCINOMA OF THE BREAST.

We have here a depression just above the left mammary gland and apparently unconnected with it at present. It is connected with the lymphatic ducts, reaching from the gland to the axilla. There is very little retraction on pressing against it. It is sore to the touch, but not otherwise painful. The patient denies that there has been any injury received at that point, but said she had an abscess which involved the arm shortly before this appeared or developed. Even if this is a case of secondary infection, I should think we have an epithelial tumor from inclusion of the epithelium directly from the newly-created skin, forming true carcinoma, and as such it ought to be extirpated. It probably has a traumatic origin here. What I mean by traumatic origin of carcinomata in such cases is that there is an actual inclusion

of a portion of the skin from which proliferation of the epithelium goes on, and in this way forms carcinoma. That is the method of their original development, so that when these cases come to us stating they have received a bruise or injury, as many of them do, it is not always a fancy on their part, but probably based on some actual injury previously received. There is but one remedy for these cases, as in carcinoma from any other cause, and that is removal of the gland and all of the hardened tissue surrounding it, and the patient will be so advised.

TUBERCULOSIS OF THE CERVICAL GLANDS.

I now show you a case of recurrence of tuberculosis of the glands of the neck after three extirpations performed respectively in January, June, and August, 1893. The glands were removed from the left side of the neck. There is now just outside of the line of the old incision a distinct glandular formation. At this point I can grasp the swelling with my thumb and finger. It is not free on this side, and seems to have extended to the other glands; and notwithstanding the patient's apparent disinclination to undergo an operation, I would advise it, because it is the only known means of preventing dissemination of the tubercular infection when developed to this degree. In this ulcer on the right side there is an induration extending all about it for a considerable distance. I am inclined to think, after examining and considering this case carefully, that in the majority of cases of operation for tubercular glands we do not take pains enough to enucleate the ducts with the glands. I think the lymphatics themselves should be removed, especially those in the immediate vicinity of the lymphatic glands, because in them, doubtless, may be found bacilli which reproduce the disease, which arise in neighboring glands later on. The thorough extirpation of tubercular glands and their communicating ducts is just as necessary as the thorough removal of carcinoma, and it is the only thing to be considered. It involves sometimes such an extensive dissection of the neck that one rather hesitates to undertake it, and he may prefer to have some one else do the operation rather than attempt it. It is a matter of extreme difficulty as well. Any surgeon who has operated much in cases of tubercular glands of the neck must have encountered many of them in which the connective tissue is so dense and strong that it is almost impossible, without exercising considerable strength and patient dissection, to enucleate them from healthy tissue. Enucleation, in the proper sense of the word, is not possible in such cases. In these cases we simply excise the tubercular glands, or all of the tubercular tissue. My colleague, Professor Senn,

dissects the lower portion of the mass first, and when firmly in hand the upper portion, attached high up next the root of the styloid process, is twisted off. This is equally advisable, whether for the prevention of hemorrhage or for the greater facility of operating.

LYMPHANGITIS.

This patient comes to us with an oedematous arm, quite firm on pressure, a little red, very painful to the touch, and a little fluctuation over the posterior border of the ulna. The history points to lymphatic infection,—a lymphangitis with obstruction of the lymphatics, and it is doubtless from some pyogenic infection. We have pus somewhere in these muscles, or if it has not already formed it will form in a short time and point in the shape of an abscess. I think the best treatment for this at the present time would be a series of punctures,—in the first place, to relieve the tension; second, to provide drainage; and, third, for the internal application of chemical disinfectants. The shiny appearance of the skin posteriorly looks like an erysipelatous inflammation, such as would be produced by the streptococcus, and it is doubtless from some infection or abrasion of the skin. (The patient was unwilling to have the punctures made at this time.)

MASTITIS.

We have here a case of subacute inflammation of the breast. It is not cancerous; it is altogether inflammatory in its character. It is uniform. There is no retraction of the nipple; there are pain and tenderness on pressure, which are equal in all parts of the gland. We have to deal with a case of mastitis, for which fixation of the breast and external support constitute the best plan of treatment. The case seems to be on the border line between inflammatory disease and carcinoma. In a recent case which fell under my observation, it was extremely difficult to detect whether it was mastitis or carcinoma. My inclination, from the clinical symptoms, was to the effect that it was mastitis. A few days' dressing with adhesive plaster, pulling the breast strongly upward and fastening the plaster over the neck, making two broad bands of support, relieved the pain and the swelling disappeared, and at the end of ten days the swelling which was felt in the breast had entirely disappeared. That fortunate result was obtained in an early case of mastitis. These cases get well by simply carrying out the one physiological indication of rest, which cannot be done in any other way than by fixation.

FRACTURE OF THE SCAPULA.

This patient, if my memory serves me right, sustained a fracture at the glenoid cavity of the scapula, and there was also injury to the brachial plexus of nerves which resulted in practical uselessness of the right arm. I find there is still crepitus on making rotary movements of the shoulder. The probability is that the only relief the patient will get is that by time alone, and it is not probable that any operation would be of the slightest avail in such a case. The patient now complains of weakness and pain on moving the shoulder, especially on throwing the arm forward. She was under treatment in the hospital for seven weeks with this fracture. The result is that she has had ligamentous union of the neck of the scapula, and I am satisfied no better union could have resulted from the injury as received at the time. There is considerable falling of the shoulder on this (right) side. The remote effects of these injuries are well worthy of study. To relieve the pain I would fix the shoulder temporarily by adhesive plaster, raising the arm as much as possible, and applying the plaster directly across the shoulder to the sternum. In short, I would treat it as a recent case of fracture. I would place the adhesive plaster so as to form a support to the rib and shoulder. We might add to this support by making longitudinal strips and applying them to the shoulder, extending from the front to the back of the shoulder, and thus support the scapula fully.

A CASE OF PES CAVUS.

CLINICAL LECTURE DELIVERED AT ST. GEORGE'S HOSPITAL.

BY T. PICKERING PICK, F.R.C.S.,

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GENTLEMEN,—We have before us a man aged twenty-five, who is the subject of well-marked pes cavus, associated with a considerable amount of equinus and a slight amount of varus, and what I desire to do to-day is to discuss with you the mode of production of this deformity.

There are two or three different theories as to its causation, but to my mind they are none of them quite satisfactory, and I think we shall be employing our time usefully if we discuss them a little in detail.

Bear in mind, then, that we have, in these cases, an exaggerated arching of the foot, with a peculiar position of the toes; the heel being at the same time raised and the foot inverted. Duchenne believed that this condition was due to paralysis of the interossei and the short flexor and adductor of the great toe, and has explained the mode of causation of the various deformities I have enumerated. He first begins by explaining the peculiar position of the toes, and this is easy and simple to follow. You know that, in addition to their action as abductors and adductors, the interossei flex the first phalanges at the metacarpophalangeal joint, and extend the second and third phalanges in consequence of their insertion into the expansion of the extensor tendons. Now if these muscles are paralyzed there would be undue contraction of their antagonistic muscles,—that is to say, the muscles which extend the first phalanges, and flex the other two; and this would produce the peculiar condition of the toes,—namely, extension of the first phalanges and of flexion of the two terminal ones. This, as I have said, is quite clear and easy to understand; but we have also to explain the condition of arching of the foot, and this is not so satisfactory. Duchenne believes that it is secondary to the condition of the toes, and to

be brought about, to use his own words, in the following way: "The near ends of the near phalanges push down the heads of the metatarsal bones with a force proportioned to the extent to which they are dislocated onto the heads of these bones; then the plantar arch greatly increases, and at length the plantar fascia shortens; then certain joints and their ligaments become deformed, as in all hollow feet." Now, this is not very clear, and I am not sure that I understand it myself. It seems to me that if we accept Duchenne's theory as to the causation of pes cavus, we can only explain the arching of the foot by believing that it is due to the still further unbalanced action of the flexor longus digitorum and flexor longus hallucis, which, as you know, when fully contracted flex the medio-tarsal joint, and so increase the plantar arch, and, this condition being maintained, subsequent shortening of the plantar fascia takes place.

But we have still to explain why there is a tendency to equino-varus in these cases. First as regards the equinus. In cases of paralysis of the interossei, the power of flexion of the foot upon the leg during walking is incomplete; and so the tendo Achillis, never being completely extended, becomes permanently contracted, and a condition of equinus is set up. The question arises why the foot cannot be completely flexed. If you will consider the attachment of the muscles which are principally concerned in flexing the ankle-joint,—namely, the extensor longus digitorum and the extensor proprius hallucis, I think you will readily understand this. They are inserted into the bases of the second and third phalanges, which are very movable. In the normal foot, however, during walking these bones are fixed by the interossei, and therefore enable the muscles to exert their action on the ankle-joint. Supposing, however, that the interossei are paralyzed, the phalanges are no longer fixed, and therefore these two muscles, when they contract, extend the toes and so approximate the points of their attachment, and thereby weaken their power as flexors of the ankle-joint.

Then with regard to the varus. This is due to the greater action of the tibialis anticus. This muscle is also a flexor of the ankle-joint, but it is a flexor and adductor; whereas the extensor longus digitorum is a flexor and abductor. The tibialis anticus acts from a fixed point of insertion; the extensor longus digitorum, as we have seen, when the interossei are paralyzed, acts from a movable point of attachment, and its action is thereby weakened; when then the two muscles flex the ankle-joint, the action of the tibialis anticus is more powerful than that of the extensor longus digitorum, and therefore there is a tendency

to inversion of the foot, and the production of varus. This, then, is the way in which we explain the various deformities of pes cavus, if we adopt Duchenne's theory as to its causation, by paralysis of the interossei muscles and of the short flexor and adductor of the great toe.

Another theory as to the way in which "clawfoot" is caused is just the opposite of this. It is a theory which has been suggested by Dr. Parkin.

In Duchenne's theory, as we have seen, the arched condition of the foot is believed to be due to paralysis of certain muscles, and is believed to be the cause of the equinus and varus. In Parkin's theory the equinus is believed to be the initial condition and to be the cause of the cavus.

Parkin believes that pes cavus is liable to occur in any case of talipes equinus, "provided only that the patient transmits the weight of the body for a sufficient length of time through the affected foot without the intervention of a raised artificial heel." Let me try to make this a little clearer. As you know, when we stand or walk, the weight of the body is supported on an arch, the two extremities of which—the heads of the metatarsal bones and the tuberosities of the os calcis—rest on the ground. But in cases of equinus this is not so: then the whole weight of the body is borne on the anterior end of the arch. Now, if the equinus is extreme, so that the long axis of the foot is in a line with the axis of the leg, the individual supports the weight of the body on the extremities of the metatarsal bones, and there is no tendency to the formation of pes cavus. But if the equinus is not so severe, so that the long axis of the foot is at an obtuse angle to the leg, the weight of the body is then transmitted to the toes obliquely, and there is a tendency to curl the foot up and by an overarching to bring the heel to the ground, so as to make it assist in supporting the weight of the body. As Parkin puts it, "the bending of the arch is really a compensatory change allowing the heel to again touch the ground." This constant arching of the foot gradually becomes a permanent overarching, and the plantar fascia becomes secondarily contracted and so pes cavus is set up.

But you will ask, if this is so, how do you explain the peculiar position of the toes? Well, Parkin explains it somewhat in the following way. He says, when the foot acquires the position of equinus, the first phalanges become hyperextended and subluxated upward, and in consequence of this the extensors of the toes shorten to adapt themselves to their new position, and the interossei and lumbricales

become inactive or act in a direction the reverse of normal, because their lines of action are now behind the centre of the heads of the metatarsal bones, and thus tend to increase the deformity. At the same time the terminal phalanges become flexed "either by their own weight, by adaption to the boots, or by the pull of the flexor tendons."

I need only allude to one other theory as to the causation of pes cavus. Mr. Golding Bird ascribes the condition to weakness or paralysis of the peronei muscles; but I do not think that this is likely to commend itself to your minds. There is no doubt that weakness or paralysis of the peronei may produce pure varus from overaction of the tibial—their antagonistic—muscles, but it is difficult to conceive how this unbalanced action would produce the arching of the foot, the equinus, and the position of the toes which we have noticed as being present. Let us return, then, to the two other causes which I have mentioned, and if you were to ask me which of these two causes was the right one, I should be unable to tell you. To my mind they are neither of them quite satisfactory solutions of the deformity, and it may be that they are neither of them correct, but that pes cavus is due to some other cause of which we are not at present cognizant. The main objection to Duchenne's theory is the difficulty in assigning a cause for the paralysis. Duchenne is silent on this point, but it would seem probable that he attributed it to infantile paralysis. Now, if this is so, it is possible that we may have a localized paralysis of these muscles,—the interossei and the flexor brevis and adductor hallucis,—for we know that in anterior poliomyelitis the disease may affect a single group of muscles or even a single muscle. Cases are not so very uncommon where we find that the disease has fixed on a single muscle, as the deltoid, the sterno-mastoid, the tibialis anticus, and under these circumstances I do not find it impossible to conceive that this isolated paralysis may have taken place. The other objection is the explanation of the arching of the foot which he gives and to which I have already alluded. But I think this arching may be, as I have said, accounted for by the unbalanced action of the flexor muscles. Owing to the paralysis of the interossei we first get the altered position of the toes, and so an approximation of the points of attachment of the extensor muscles, and thus they become weakened and the unbalanced action of their opponents, the flexors, produces the cavus.

We have now to say a word or two on the objections to Parkin's theory. I think it is conceivable that the arching of the foot might be produced in the mechanical way which he has described, though I cannot say that I think he has proved his case, and it seems to me

that the way in which he explains the peculiar condition of the toes is a very weak point in his theory. If the condition were set up by extreme equinus then I could understand it, but, as he says, the condition only occurs in slight cases, in which I can scarcely believe that this condition of hyperextension and subluxation is likely to occur. Moreover the flexion of the terminal phalanges "either by their own weight, by adaption to the boots, or by the pull of the flexor tendons" is to my mind a scarcely adequate explanation.

Finally, if we adopt Parkin's theory, we have to find some cause for the equinus. Now equinus as a congenital affection is very rare. Tamplin denied its existence. Little, with his enormous experience, states that he had only seen two or three cases.

It generally arises from paralysis of the extensors; or fibroid contraction following paralysis of the muscles of the calf; or, lastly, from abscess in the calf. In many cases of pes cavus which I have examined there has been no evidence of any of these conditions having existed.

I have thus endeavored to point out to you that both theories are difficult to reconcile with the condition; and the mode of production and cause of pes cavus must still be considered as unsettled, though personally, for want of a better theory, I am still inclined to give a preference to the older one of Duchenne.

BULLET WOUND OF THE POPLITEAL ARTERY AND VEIN; DRY GANGRENE OF THE LEG; AMPUTA- TION OF THE THIGH; FRACTURE OF THE PA- TELLA; HEMORRHAGE INTO THE KNEE-JOINT; EVACUATION OF THE BLOOD AND SUTURE OF THE FRAGMENTS.

CLINICAL LECTURE DELIVERED AT THE COOK COUNTY HOSPITAL.

BY A. E. HALSTEAD, M.D.,

Instructor in the Principles of Surgery and of Clinical Surgery in the Northwestern University Medical School; Attending Surgeon to the Cook County Hospital, the Deaconess Hospital, and the South Side Free Dispensary, Chicago, Illinois.

GENTLEMEN,—The first case that I have to show you to-day has the following history: E. D. G., aged eighteen, was shot on the night of March 4, at about 11 P.M. One hour later he was brought to the hospital, and, on examination, his condition was found to be as follows: His appearance was that of a person suffering from acute anaemia; his skin and mucous membranes were blanched; his pulse was weak and rapid; the respirations frequent and shallow. About the centre of the left popliteal space there was a small wound evidently made by a bullet of small calibre, from which, after removing the constrictor which had been applied by the officers, flowed, in successive jets, bright arterial blood. The extremities were cold, but pulsation could be felt in all the superficial vessels excepting those of the left leg below the point of injury. No pulsation could be felt in either the anterior or posterior tibial arteries of the left leg. The leg was prepared in the usual manner, a constrictor being applied above the wound, the vessel cut down upon, and a ligature placed around the popliteal artery on the proximal side of the wound.

This procedure checked the flow of arterial blood, but there still continued a hemorrhage, which was found to come from a wound in the popliteal vein. The vein was then isolated and secured with a

catgut ligature. The hemorrhage then ceased entirely. The wound was closed by suturing and a proper antiseptic dressing applied. The patient was then placed in bed, the leg elevated, and external heat supplied. Stimulants were given freely, and, at the same time, large saline enemas ordered with the hope of improving the circulation. The patient's condition improved rapidly. The following morning his pulse was only 100, and his temperature, which had been subnormal, was now normal, and his general appearance much improved. However, there was still no evidence of circulation in the injured leg, which was cold and anaesthetic. The anaesthesia at this time extended only to the ankle; an area of about two inches in width above this was extremely hyperaesthetic. Amputation was advised, but refused by the patient.

During the next three days the patient's condition was much the same. His temperature varied between 100° and 101° F.; his pulse from 100 to 120. The foot and leg were still cold and apparently bloodless. The toes had gradually become black in color and shrunken. Anaesthesia had extended up to the lower third of the leg. Within the last three days the leg has become discolored up to the tuberosity of the tibia, above which a sharp line of demarcation has formed. The patient's general condition has remained about the same. His pulse is of a good quality, and has never been above 120. As the patient has now given his consent, I will amputate the thigh just above the condyles of the femur. While he is being anaesthetized, I would like to call your attention to the prognosis in these rather rare cases of injury to the popliteal vessels. In all cases where there is a wound of both artery and vein the leg becomes gangrenous if not amputated immediately.

Wounds of the artery alone have so far been followed in nearly all cases by loss of the leg. Where the vein has been divided without injury to the artery, if the circulation be otherwise normal, the leg may be saved, although the prognosis is extremely unfavorable. In the cases that have been recorded up to the present time, most of the patients have died either as the result of hemorrhage or from septic infection. In five cases (reported by Poland) where rupture of the popliteal vessels resulted from forcible extension of contracted knee-joints, gangrene followed in every case. Three of these died of sepsis and two lived after amputation had been performed.

You will observe that the prognosis is very different in these cases where the circulation is destroyed as the immediate result of an injury from that where the circulation is gradually obstructed, as in cases of

popliteal aneurism, or where the vessels are pressed upon by a tumor. The reason for the more favorable prognosis in the latter is that during the gradual obstruction the collateral circulation has become sufficient to nourish the leg.

Another point that I wish to call your attention to is the condition of this leg. We have here an example of what is known as dry gangrene,—that is, necrosis from a failure of nutrition without the presence of the saprophytic germs. The dead tissue in these cases remains odorless and is shrunken and hard. This relatively favorable condition is the result of cleansing the leg and afterwards keeping it enveloped in dry antiseptic cotton. In the so-called moist gangrene we have the presence of the saprophytic micro-organisms, which adds another element of danger to our patients,—that of death from toxæmia, or, where there is a mixed infection, from sepsis. In this case the favorable conditions found are attributable to the absence of any kind of infection.

I now wish you to observe carefully the way in which the leg is being prepared for operation. First, it is shaved from below the knee to the groin; it is then scrubbed with green soap and water for nearly ten minutes. After this it is washed with alcohol and ether. Next we wash carefully with a one to one thousand solution of bichloride of mercury, the part below the place of amputation being enveloped in sterilized towels. The leg is elevated for a few moments to allow the blood to flow out of it and an elastic constrictor applied as high up as is possible. We now begin the amputation by making two punctures through the skin, one on each side of the thigh, just above the condyle, to mark the upper limit of the flaps. A curved incision is now made, beginning at the outer puncture; then downward and across the anterior surface of the limb just above the line of demarcation, and upward on the inside of the thigh to the puncture above the inner condyle. This flap, consisting of skin, superficial fascia and deep fascia, is now reflected back and a similar, though shorter, flap is made on the posterior surface of the limb. The remaining soft tissues are divided by a circular incision at a level with the upper margin of the reflected flaps.

The periosteum is incised at the same level and pushed up for a distance of an inch. The bone is now sawed through, while an assistant holds back the periosteal and skin flaps. The next step is to suture carefully the periosteal flap over the end of the bone with catgut sutures. After this we search for and ligate all the large vessels. The wound is now packed with sponges, the stump elevated at right angles to the table, and pressure made over the end while the constrictor is

removed. After making pressure on the stump in this position for five minutes the sponges are removed, and any bleeding point of consequence is caught with an artery forceps and subsequently ligated. The pressure made upon the cut surface has checked the oozing from the small vessels, so that now we are ready to suture the flaps. Before doing so, however, we find the cut end of the sciatic nerve, pull it out, and cut it off an inch higher up. The flaps are now united, first with a row of interrupted retention sutures of silkworm gut, and then with a continuous coaptation suture of fine silk.

A small opening at the lowest point is left, through which a small drainage-tube is passed. This drainage-tube will be removed after thirty-six hours, and the opening closed by the suture that I now introduce, but do not tie.

The stump is dressed in the ordinary way, considerable pressure being made over the end to check oozing and to prevent the accumulation of fluids. A short posterior splint is applied outside of the dressing to support the limb and the patient placed in bed with the stump elevated.

CASE II.—The next case that I present to you has this history: O. K. J., aged thirty-eight, an American, was admitted to this hospital March 9, 1896. About three hours before admission he fell from a ladder, striking on his right knee. On examining the knee shortly after he was admitted it was found greatly swollen and discolored, and so painful that it was impossible to determine the exact nature of the injury. However, fracture of the patella was suspected. The patient was put in bed, the leg elevated, and ice applied to the knee.

As you see, the knee is still discolored and swollen, but considerably less than it was when he entered. The pain is yet so intense that any examination is impossible without first anæsthetizing him.

With the patient anæsthetized, it is easy to determine that the joint capsule is distended with fluid, which is probably blood, inasmuch as the effusion appeared immediately after the accident. The tissues around the joint are also infiltrated with blood. On examining the patella, we find that it is separated into at least two parts, which are separated by an interval of nearly three inches. As would be expected, crepitation cannot be elicited because it is impossible to approximate the fragments.

The diagnosis of fracture of the patella at times presents many difficulties. We have, as in this case, the history of a fall upon the flexed knee, or a distinct snap is heard when the bone breaks as the result of muscular traction. In all cases we have inability to extend the leg

when the fracture is complete. This may also occur in other conditions, as, for example, in separation of the quadriceps or patellar tendons.

Displacement of the patella upward, as occurs where the ligamentum patellæ has been torn from its attachment, has been mistaken for the upper fragment of a fractured patella. Dislocation downward in a rupture of the quadriceps tendon has likewise been regarded as the lower fragment of a fractured patella.

The interval between the two fragments, which one might regard as a positive sign of fracture, is closely simulated by a hemorrhage into the prepatellar bursa when the periphery of the sac is filled with a blood clot, while the centre contains fluid blood.

The only positive sign that we have is the ability to move the two parts of the patella independent of each other.

To-day I wish to call your attention especially to the treatment of this very important class of cases. There is a great difference of opinion among surgeons as to what is the best treatment to follow, and at present there is no one method by which we can treat all of these cases and secure uniformly good results. At the present time I think the tendency is towards the non-operative treatment, although we have in some cases conditions present which necessitate operative measures. The most commonly employed method of treating these fractures is by simply extending the leg, with slight flexion of the thigh and approximation of the fragments, either by a figure-of-eight bandage, or by strips of adhesive plaster so placed that the fragments will be held in apposition. The leg is then incased in a plaster-of-Paris cast and the dressing allowed to remain for at least four weeks.

This method is not applicable to those cases in which the fragments are widely separated, or where there is any considerable amount of blood effused into the joint. As Hutchinson has shown, the extravasation of even a moderate amount of blood prevents the coaptation of the fragments, in which case, if union did occur, it would be fibrous. When the fibrous band between the fragments is more than three-fourths of an inch in length the function of the joint is greatly impaired. Furthermore, the presence of the blood in the joint cavity stimulates the growth of new connective tissue, which in time contracts, causing shrinkage of the capsule and adhesions between the joint surfaces, which results in more or less ankylosis.

An important modification of this method has been made by Schede. He has in all cases first punctured the joint with a trocar and evacuated the fluid blood. After this he washes out the joint cavity with a

weak antiseptic solution. The fragments are then approximated and held in place by a properly-applied flannel bandage, over which a plaster cast is placed. One objection to this method is the danger of infecting the joint at the time of puncture. This danger is greatly enhanced because of the blood that always remains in the joint, even after the most careful irrigation after puncture. Riedel has shown that after these accidents a large quantity of blood is usually extravasated between the vasti muscles on the inner side of the thigh, which communicates with the knee-joint. It is impossible to remove this blood by irrigation after puncture. The slightest amount of infective material carried into the joint under these circumstances is sure to be followed by disastrous results.

Another method that has during the last few years given good results is that of Ruland. The leg is elevated and ice applied for the first twenty-four hours. At the end of this time, while an assistant holds the fragments in place, the leg is thoroughly massaged. After this it is incased in a lightly applied elastic bandage. This procedure is repeated twice during the twenty-four hours. In three days active and passive motion is commenced, while an assistant supports the fragments as before. After eight days the patient is allowed to get out of bed and sit in a chair, and on the fourteenth day to walk. The union is complete at the fortieth day.

This treatment is indicated only in those cases where the rent in the capsule is small, and where there is not excessive diastasis of the fragments. The advantages claimed for this method are that muscular atrophy is slight, and therefore the usefulness of the limb is soon restored, and that ankylosis never occurs.

The difficult part of this method is to perfectly immobilize the patella while the leg is being massaged. In case this is not accomplished, it is scarcely possible to get any union and impossible to secure bony union.

By employing any one of these methods that I have mentioned we can never be sure that there is not some foreign substance between the fragments. In many cases the periosteum covering the patella breaks at some distance above or below the line of fracture in the bone and falls between the fragments, thus preventing union. In all cases the presence of blood in the joint is a serious menace to the future usefulness of the limb. Both of these conditions can be eliminated by freely opening the joint cavity and exposing the fractured bone. The exact condition of the bone can then be determined, any intervening tissue can be removed, and the joint thoroughly washed out.

The chief danger of this operation, and one which is difficult to overcome, is that of infection of the joint, which is always a serious condition. The reason that infection occurs so frequently is because of the slight resistance against infection that this joint in common with all other joints offers against infection, especially when the issues about the joint are further impaired by being infiltrated with blood.

In the case now before us the presence of excessive hemorrhage into the joint, together with the fact that it is impossible to determine the exact nature of the fracture, I regard as sufficient indication for operative measures. Realizing the great danger of infection, we will throughout this operation observe the strictest asepsis. I now open the knee by a transverse curved incision, with the convexity directed upward. This incision is carried down through the skin and fascia; this flap is then dissected down, thus exposing the fractured patella and opening the joint. I find on examining the patella that it is separated into three parts by a transverse line of fracture, extending through its centre with a longitudinal fracture of the lower fragment. The joint cavity is completely filled with clotted blood; this we remove by thoroughly irrigating the joint with a warm salt solution. This being accomplished, we unite the lower fragments with a periosteal suture of catgut. A small opening is now drilled through each of these two fragments and two corresponding ones in the upper. The drill is made to pass obliquely through the bone and emerge a short distance from its lower surface.

The two lower fragments are now united to the upper by catgut sutures, which are passed through these openings. The operation is completed by suturing the flap back in its place with fine catgut sutures and the knee dressed with the ordinary antiseptic dressing, over which is placed a plaster-of-Paris cast. If no untoward symptoms arise, this dressing will not be removed until union of the fractured bone has taken place, which will probably be completed in about six weeks.

Bony union, after fracture of the patella, or where the patella has been divided, as is frequently done in resection of the knee, even when it is united by suture, seldom, if ever, occurs. Fibrous union, where the interval between the fragments is not too great, gives a useful limb, but one that is seldom as strong as before the accident.

WOUNDS OF THE HEAD AND FOREARM; CIRCUMSCRIBED TRAUMATIC ANEURISM.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY OF LOUISVILLE.

BY W. O. ROBERTS, M.D.,

Professor of Surgery and Clinical Surgery in the University of Louisville; Member of the Louisville Clinical and Surgical Societies, etc., Louisville, Kentucky.

GENTLEMEN,—You will remember that we operated upon the patient before you at the clinic a week ago, enlarging an opening in the skull with Rongeur forceps. For the benefit of those of you who were not here then, the history of the case is, that the patient, a male, aged twenty-nine years, was struck with a sharp instrument three months ago, inflicting a wound just above and a little in front of the right ear. The wound was dressed by the attending physician at the time, the injury being considered a trivial affair. The wound never healed, and two weeks ago he developed symptoms of irritation of the brain; he became very cross, irritable, etc. He then applied to us for treatment, and after an examination we discovered evidences of caries of the skull, and suspected that there was a piece of necrosed bone irritating the brain. By a semicircular flap we exposed the opening in the skull, which proved to be about the size of a lead-pencil, extending entirely through both tables of the skull, and at the bottom of this opening there was a piece of necrosed bone. The edges surrounding the opening in the bone were also in a carious condition. The opening was large enough to admit the Rongeur forceps, with which we removed all carious bone, and were then able to remove the loose piece which was irritating the dura mater. This left a hole through the skull about the size of a silver quarter. The dura mater was very much thickened by inflammatory deposit. We then closed the wound in the soft parts, leaving a sufficient opening at the lower angle for drainage. He has not had an untoward symptom since the operation. He suffered more or less pain and discomfort in his head before the operation, but has not had the slightest pain or discomfort since we removed the diseased bone.

As I remove the dressings you observe that they are perfectly dry ; not a sign of suppuration. The chances are that this man will go on to complete recovery, and will have no further trouble. It would seem that all the symptoms in this case were caused by irritation of the brain by the piece of dead bone which we removed. Without an exploration that piece of necrosed bone might have remained indefinitely, until finally some serious trouble, such as epilepsy or insanity, would have resulted.

CASE II.—The next patient is a boy aged thirteen years, who came to us last Tuesday at the close of our lecture. He had just been shot by a companion with a pistol, the ball passing entirely through the forearm three inches below the elbow. The force of the bullet having been spent, it dropped by his side, after passing through his arm, and I present it to you, together with the patient, for examination. The pistol was a thirty-two calibre, which made quite a good-sized wound at the point of entrance and also that of exit ; but, fortunately, the ball in passing through the arm, missed all the important blood-vessels, the hemorrhage being very slight. The wounds were dressed antiseptically at the time, and as I remove the dressings you will see there has been practically no oozing, and the wounds have almost completely healed. If in its passage through the arm this bullet had divided the brachial artery, we would have had considerable hemorrhage, or if it had made a small opening in the vessel a traumatic aneurism might have developed later. Whenever an artery is wounded, without being entirely cut through, an aneurism may develop at any time within a few hours to several days or weeks. Whenever you have a shot wound or a stab wound in the vicinity of a large blood-vessel you should always make a very guarded prognosis, because one can never tell just what the result is going to be.

I remember a case which occurred only a short time ago, where a man was shot, the bullet passing entirely through his thigh, starting at the inner and coming out at the outer side ; its course was almost directly across the femoral artery. There was little or no hemorrhage at the time and the wounds healed without any delay. In two weeks after receipt of the injury the man had a little pain in the vicinity of the wound of entrance, and on rubbing his thigh at this point he discovered a lump about the size of a partridge egg. This lump steadily increased in size and six weeks after its appearance he was sent to me to be operated upon for aneurism of the femoral artery. When he came to me the aneurism was distinctly circumscribed, about the size of a duck's egg, and gave him no pain to speak of except what you would expect from

pressure. He was able to walk about with very little inconvenience, and his general condition was excellent. He arrived here Saturday afternoon. I sent him to the St. Joseph Infirmary and told him I would operate upon him the following Monday. I wanted him to go to bed and rest for forty-eight hours before the operation. He went to bed, and Sunday morning, in getting out of bed quickly to empty his bladder, he felt a sudden pain in his leg, which in a little while began to increase rapidly in size. He became very sick at the stomach and was unable to get back to bed. A nurse was called to assist him, and found him in a condition, she said, of great shock, pulse exceedingly feeble and beating at the rate of 128 to the minute. The surface of the body was pale, the man was nauseated ; his entire thigh was swollen to almost twice the size of that of the opposite side. I was telephoned for immediately, and when I reached the patient he showed unmistakable evidence of great loss of blood. His pulse was very feeble,—138 to 140 to the minute ; surface of the body pale ; lips blue ; respiration sighing ; the thigh enormously swollen, and the original tumor could not be made out. It was very plainly apparent what the nature of the trouble was. In an attempt to get out of bed the aneurismal sac had ruptured. When this man was shot there was evidently a bruise of the outer coat of the femoral artery, the inner coat had given way, the outer coat dilated slowly but steadily until the tumor which had been felt had formed. It was a traumatic circumscribed femoral aneurism, and in this man's attempt to get out of bed the sac had ruptured, and this circumscribed traumatic aneurism became converted into what is commonly called a diffuse aneurism, which really is no aneurism at all, because there is no wall to it, the blood simply pouring out into the cellular tissue. Fortunately, I had made a careful examination of the patient previously, and knew the exact location of the tumor which constituted the circumscribed traumatic aneurism. The man was put on the operating-table at once, the case then being very urgent, and Dr. Holloway, being in the building, was called to assist me in the operation. The man was gotten under the influence of ether as quickly as possible ; the leg was elevated and an Esmarch bandage applied well up to the inguinal region. I then made a free incision fully six inches in length right along the course of the femoral artery, the centre of the incision corresponding to the original traumatic circumscribed aneurism. I found the tissues filled with blood-clots, all the soft tissues being greatly stained. I cleaned out all clots thoroughly with my hand, then irrigated the wound with a one to forty solution of carbolic acid and searched for the opening in the artery. There was an opening in the

femoral artery as large as the diameter of a lead-pencil. The opening had occurred in the artery at the upper portion of Hunter's canal. I ligated the vessel just above and below the opening, the artery at these points being in a perfectly healthy condition. In ligating the artery I used an aseptic silk ligature, cutting the ends short; then removed the Esmarch bandage, and there was not a particle of hemorrhage. The wound was then brought together in the usual way and the usual dressing applied. The man made a complete recovery without the development of an untoward symptom.

The case illustrates the danger of delaying operative measures in a circumscribed traumatic aneurism. This case and another of a similar nature convinced me of the great importance of operative interference immediately upon the discovery of a circumscribed traumatic aneurism, because you cannot tell just how soon the aneurism is going to rupture.

A young man, not long ago, in an altercation with another, was stabbed with a pocket-knife. The knife struck him just above the clavicle on the left side. There was comparatively little hemorrhage following the injury, and when a physician reached the patient there was no bleeding at all, the only evidence of injury being a little wound about one-eighth of an inch long. He thought all that was necessary was to put a piece of adhesive plaster over it, which was done, and the man went home. The doctor cautioned him, however, to remain at home until this wound had healed. He stayed in for about a week, he said, not because the wound gave him any trouble, but because the doctor had recommended such a course. He then went out, and, getting on a wagon, rode five or six squares from home. In getting out of the wagon he suddenly felt that he had lost power over his left arm. Then he developed general symptoms of great loss of blood, such as I have described as having taken place in the other case. In addition to paleness and feebleness of pulse on the right side, there was total absence of pulsation at the wrist of the left side. He had difficulty in breathing, and when he was taken home, which was only a short time after the development of the symptoms narrated, his physician was called, and found complete dulness all over the left side of the chest, and the apex-beat of the heart was felt over to the right side just under the right nipple. The surface of the body was cold, the pulse on the right side was very feeble and rapid, and the man had great difficulty in breathing. It was very evident that this man was dying from hemorrhage, and that the hemorrhage had occurred into the left pleural sac. His condition was so critical when I saw him that all operative interference was out of the question, and in a little while he

died. Post-mortem examination revealed the fact that this man had, as a result of this puncture wound, a small traumatic aneurism of the subclavicular artery ; the sac of this aneurism was not larger than half the segment of an egg. The sac had ruptured into the pleural cavity, which was distended with blood. The lung on that side was flattened and forced back against the spinal vertebrae, and the heart was pushed over to the right side of the chest. There was a circumscribed traumatic aneurism, due to the puncture wound, which is usually the cause of this character of an aneurism, a very small opening being made in the artery, so that just a little blood came out at a time, lymph formed on the outside of the sac, and the sac gradually grew larger and larger, and finally ruptured.

I could relate several other instances where circumscribed traumatic aneurisms have ruptured and serious consequences resulted, but these cases will serve as illustrations. Therefore I say there is no use of temporizing with these cases ; it is dangerous to temporize with them. I do not believe there is any use of attempting any other method to cure the condition, except ligation of the artery above and below the wound in it, and I think this ought to be done just as soon as you recognize the existence of a circumscribed traumatic aneurism. I advise operative interference at once, because you cannot tell how soon the sac is going to rupture, and you can readily understand the great danger to the patient's limb and life. When rupture occurs there is not only danger to the affected limb, but also great danger to the life of the patient, and when you have to operate under these circumstances, you should make your incision so the centre of it will correspond with the original tumor. Make a good big opening, so that you can clean out the clots without contusing, tearing, or bruising the tissues ; a long cut will heal just as quickly as a short one. When you make an incision clean out all the clots thoroughly, and wash them out with an antiseptic solution ; then look for the wound in the vessel, and ligate it above and below.

In these cases it is always very important that you envelop the limb in absorbent cotton ; it is also important in the application of bandages, to hold the cotton in place, that you do not get them too tight ; the cotton is for the purpose of keeping up the normal temperature of the part. These tissues have lost a great deal of blood already, and after ligation of the artery the blood-supply is going to be very much less than normal for a long time ; consequently, you have to resort to artificial means to keep up the normal temperature, because if you do not you are very apt to have gangrene as a result.

PERINEAL SECTION.

CLINICAL LECTURE DELIVERED AT THE KENTUCKY SCHOOL OF MEDICINE
HOSPITAL.

BY WILLIAM L. RODMAN, A.M., M.D.,

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Surgeon of the Kentucky School of Medicine Hospital ; Surgeon to
the St. Mary and St. Elizabeth Hospital ; Consulting
Surgeon to the Louisville City Hospital, etc.,
Louisville, Kentucky.

GENTLEMEN,—The first case I shall bring before you to-day, after the patient has been anæsthetized, is one of perineal section, also called cystotomy, external urethrotomy, median lithotomy ; it has all of these different names, according to the condition for which it is done. The condition for which we are about to operate upon the patient to be brought before you is stricture of long standing ; not a very close stricture, but one which has not been relieved by other and more ordinary means, and on account of that fact there is considerable prostatic and vesical irritation, the man getting up repeatedly during the night to void his urine, micturition being necessary every half-hour during the day. It has been thought best, therefore, to put the bladder entirely at rest by making an incision from below. I am particularly glad to bring this case before you to-day, as we have on former occasions entered the bladder by a different route,—*i.e.*, by suprapubic cystotomy. The condition from which this man suffers, I think, can best be treated by perineal section, or the low operation. We do not think that there is a stone, tumor, or other foreign substance in the bladder. The man has no considerable enlargement of the prostate gland, if any at all ; therefore we believe better drainage will be made by the lower than by the upper route. This you will perhaps remember is just the opposite from what I said in speaking of a case of suprapubic cystotomy. In elderly men with considerable enlargement of the middle lobe of the prostate gland the bladder will drain best by

the high operation ; such, however, is not the case in young children or in middle-aged subjects, as a general rule.

It is not my purpose, nor can I take the time, to consider the different indications for this or that operation. Sometimes undoubtedly the suprapubic operation is best, then again the low or perineal route is to be preferred. Of the perineal operations we have several. I shall speak particularly to-day of the median route, and will give you the technique of the operation. In the first place, the patient must have his alimentary tract well opened by purgation ; for this castor oil is perhaps the best agent we have, as it acts upon the entire alimentary canal. It is not only necessary to give a purgative the day before the operation, but it is also wise to use a rectal injection an hour or two before operating, for in this operation it is absolutely necessary to have the rectum empty, one of its chief dangers being wounding of the rectum ; in fact, this is the chief danger. Not only should the rectum be in a practically empty condition when the patient goes on the operating-table, but it is also necessary to sterilize the urine by means of boric acid and salol for several days before the operation. This is shown to be of advantage not only in this, but in all operations upon the genito-urinary tract. Having done this, having given your patient a general bath, having shaved the pubes,—and we also in this case for certain reasons have shaved the suprapubic region and well down to the patient's knees,—then the operator should choose at least two or three trustworthy assistants besides the anæsthetizer. In this operation especially should the operator have a sufficient number of assistants. The patient, having been anæsthetized, is put in the lithotomy position, as it is called,—that is, he will be brought with the nates well down to the edge of the table and the thighs flexed upon the abdomen, the management of each leg and thigh being intrusted to an assistant. Then there should also be one who will hold the staff in the position that the operator prefers. There are a variety of staffs which may be used for this purpose ; in my judgment, the best has a marked curve. I regard the instrument I show as the best, and always use one of this character, although other operators may prefer one of a different pattern. Having introduced the staff into the bladder, you must put it in the position in which you desire it to remain. Usually that will be at a right angle. Now you may hook it up under the pubic bone as I show you and as most operators prefer, or you may make it bulge the perineum. You will notice that the staff has a groove in the centre. If we were going to do a lateral lithotomy the groove would be on the side. Having the staff in posi-

tion, the operator, either sitting on a stool or, better, in a kneeling position, should then introduce the left index finger well into the rectum ; he carries it upward and forward until he feels the apex of the prostate gland, and of course he will feel the staff ; now, with the finger in the rectum pressing at the apex of the prostate gland, you feel the staff, which is your guide ; then take a long, straight knife or bistoury and make a puncture, beginning from one-half to three-fourths of an inch in front of the rectum, going with one puncture down to the groove in the staff. After reaching the staff and being sure that you are in it, incise the membranous portion of the urethra to a certain extent, also nick the prostate gland slightly, and, finally, as you withdraw the knife, enlarge the superficial opening so that a triangular wound is made. In other words, you will not cut the urethra to the same extent that you do the superficial structures ; if you do, another one of the dangers of the operation—*i.e.*, injury to the bulb of the urethra—may be encountered.

As a general rule, there is no considerable hemorrhage after median cystotomy or lithotomy. You will remember what I have said on other occasions, that the middle line is always a safe one in surgery. In opening the abdomen the same rule holds good ; the middle course is always safer, as you are away from the blood-vessels. There is not a single vessel divided that is worthy of a name in doing a median lithotomy. Sometimes, however, there is an anomalous distribution of arteries in this locality, and the vessel of the bulb may be cut ; not often, however. The structures that will be cut through in making an incision from the skin down to the bladder are the skin, the superficial fascia, the superficial layer of the deep perineal fascia, the triangular ligament, the levator ani, which extends to the raphe, a few fibres of the compressor urethrae, the membranous portion of the urethra, and the apex of the prostate gland. The surgeon, having introduced his knife into the staff and being sure of this fact, puts it aside after enlarging the incision. The index finger of the right hand should then be carried down through the incision in the urethra, then by a gentle rotary motion into the bladder, if you care to do so ; at the same time the staff is withdrawn. The staff should not be withdrawn, however, until you have either your finger or a blunt instrument, like the one I show you, in the bladder ; then take out the staff. This is a precaution that at first might seem unnecessary, yet it is a very wise one. Never withdraw the staff until you have another instrument in the bladder, because you may fail to get into the bladder at all unless this precaution is observed.

The principal dangers of a median cystotomy primarily are wounding the rectum and injury to the artery of the bulb, both of which I have seen occur in the hands of the best surgeons.

You will observe that I have been somewhat delayed in the operation, and I will explain that this has been caused by two things. The man was not thoroughly anæsthetized, and I had to wait until he became so. At the first puncture of the knife I entered the groove of the staff and followed it down to the apex ; I made a small opening in the membranous portion of the urethra, nicked the prostate gland, and at once carried my finger into the bladder. There was no delay whatever in this part of the operation, but I hesitated and reintroduced my finger into the bladder to assure myself that I had not gone into something else, because I could not understand why there was an absence of the usual gush of urine when the finger entered the bladder. I directed that the patient should not pass his water after eleven o'clock this morning, and he had not passed any up to ten minutes before he went under chloroform. He evidently urinated either just before or during the time the anæsthetic was being administered, which accounts for the fact that there was no gush of urine when my finger entered the bladder. It was empty.

If there is any operation in surgery that requires a knowledge of anatomy and perfect accuracy in every step, it is a median or lateral lithotomy. This operation used to be considered a test of skill, and the surgeon, especially in pre-anæsthetic times, who could most quickly and most successfully remove a stone from the bladder was regarded as the superior man. It is an operation that should be done very carefully, and, now that we have anæsthesia, we do not operate in great haste. The disadvantages of this operation, if we were dealing with a stone in the bladder, would be very great. You noticed that the opening I made was small, yet it is as large as we need. It is merely for drainage ; nothing else. If there was a stone in the bladder, it could not be removed through this opening unless it were a very small stone. A small stone can be removed through the space given you by a median cystotomy, larger stones should be removed by the lateral route or the suprapubic, and the largest ones should be removed only by the suprapubic method. The indication for median cystotomy is when complete drainage of the bladder is desired. It is also done in prostatectomy, but in the latter indication it is not the best operation ; you cannot get at the prostate gland and remove any considerable portion of it successfully through an incision made in the perineum. It has been done, however, and Belfield, of Chicago, gives the operation his sanction,

though he says it is a procedure inferior to that by the suprapubic route in cases of enlarged prostate where prostatectomy is advisable.

The lateral operation, where you go through somewhat different structures, is done in the following way: The staff has a groove on the side,—on the left side, as a rule, because the majority of operators are right-handed. Of course, if an operator were left-handed, he should have a staff with the groove on the right side. You not only cut through the membranous portion of the urethra, but extend your incision half-way through the left lobe of the prostate gland, going well up to the neck of the bladder. Here the gush of water is more apt to follow than it is in median cystotomy.

This man always will be able to, in a measure, control his urine if he tries. There will not be a constant draining necessarily. I have seen cases that could void their water voluntarily after perineal section, but in the lateral route you cut through somewhat different tissues from what you do in the median operation, and the patient has less control over the bladder contents. There is greater danger of hemorrhage in the lateral operation. If you get too far out you might possibly cut the internal pubic artery. If the knife is introduced too far anteriorly the bulb is in great danger. The rectum is not so apt to be cut in the lateral operation as it is in the median. This is the chief danger in median cystotomy, though I do not think it will occur often if the operator keeps the finger in the rectum, as I have just done, which is Allerton's method.

Now, as to the after-treatment of this patient. The statistics of median cystotomy, perineal section, or external urethrotomy are very good indeed. I am very much inclined to agree with everything Dr. Holloway has said about the superiority of this operation over the suprapubic in many instances; in fact, I think that in placing the suprapubic operation upon a firm basis, giving it the recognition to which it is undoubtedly entitled, and which has been accorded it by all modern surgeons, that we really have in a certain sense of the word taken a step backward, and have overlooked the superior advantages of perineal section in many instances. One does not see nor hear of one perineal section now where we used to see or hear of half a dozen or more. Suprapubic operations were not done at all twenty years ago. It is an old operation, but recently revived, and really did not become popular until about twelve years ago. There are cases, of course, in which the suprapubic operation is to be preferred. If there be an encysted stone or tumor of the bladder, if there be any part of the bladder you desire to inspect, etc., then, as a matter of course,

the high route should always be chosen. By the aid of an electric lamp you can work upon the interior of the bladder, even catheterizing the ureters successfully, as you saw me do not long ago. I am sure the dangers of the suprapubic operation have never been dilated upon as they should have been. The advocates of this procedure have performed the operation far more frequently than they should. It being a more dangerous operation than perineal section, it should not be done unless there are some distinct contraindications to the lower route.

I recall with much satisfaction that perineal lithotomy was given its popularity very largely on account of the experience of Kentuckians. The greatest lithotomist that ever lived in this or any other country, I might say, was the first professor of surgery in this institution, Dr. Benjamin Dudley, of Lexington, Kentucky. He was undoubtedly the greatest lithotomist the world has ever seen, and his results have not been approached even by modern surgeons. Dr. Dudley operated, so I am told by a friend, one hundred and eighty-seven times by the perineal route, and only lost three patients. These were lost because of previous disease of the kidneys, and we know that some patients with renal complications will die after any operation upon the genital tract. The elder Gross made his reputation as a lithotomist while professor in the University of Louisville. Not only did Gross make this reputation, but Holloway and Yandell have been noted lithotomists for the last twenty-five or thirty years. There is no gentleman in this country who has done better work in this line than your senior professor of surgery. I do not know what the statistics of Holloway and Yandell are, but they are very good. Briggs, of Nashville, was also a very successful operator in this line.

The most noted and successful lithotomists in this country are men in the Western and Southern sections. This is due to the fact that more stones are encountered in this part of the country than in others. In the New England States stones of the bladder are rare, but in the Mississippi Valley and in Kentucky, Tennessee, and Ohio they are exceedingly common. No one has ever given a satisfactory explanation of this fact. Many theories have been advanced, but we will not take time to go into the subject at this lecture, except to say that the drinking of limestone water was believed and has been taught for a long time to have some considerable bearing upon the production of vesical calculi in this part of the country.

Some excellent results have been secured by the suprapubic route. I reviewed the subject several years ago in a report on surgery, and at

that time the best results had been obtained by Assendelf, who operated one hundred and two times upon children, with only two deaths. Almost all children get well after operations upon the bladder. You might say that Assendelf's results prove that suprapubic lithotomy or suprapubic cystotomy is safer than the perineal method, judging from the results just quoted; but you must remember that these operations upon children should always be successful, and all of Assendelf's operations were upon children. There is practically no reason why they should not get well in every case, barring accidents, because the bladder in the child is practically an abdominal rather than a pelvic organ. There is no danger of peritonitis, the bladder drains admirably well, and these cases should all recover. The majority of patients with stone in the bladder will be children under thirteen years of age, and these cases always give the best operative results.

PERINEAL SECTION—REMARKS UPON THE TECHNIQUE OF THE OPERATION.

CLINICAL LECTURE DELIVERED AT THE KENTUCKY SCHOOL OF MEDICINE HOSPITAL.

BY JAMES M. HOLLOWAY, A.M., M.D.,

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GENTLEMEN,—I wish to emphasize the point made by Dr. Rodman, that you must be sure to have the finger in the bladder before withdrawing the staff. It is a very unsatisfactory and hazardous procedure to withdraw the staff and then try to introduce the finger into the bladder.

One of the most accomplished and skilful operators that I ever saw was the late Dr. Charles Bell Gibson, of Richmond, Virginia. At one time he invited a number of distinguished surgeons and myself to see him perform the operation of lithotomy upon a well-grown male child aged about three years, and just as he began the operation he said to one of his assistants, "Note the time." He was operating against time, although the patient was under the influence of chloroform. Gibson never got his finger into the bladder, although he worked one and one-half hours. Dr. Campbell, of Augusta, Georgia, who was present at the time, also tried to get into the bladder, without success. They not only tried to enter the bladder with the finger, but with probes, bougies, etc., but were unsuccessful, and the operation was abandoned. The shock killed the patient.

The circumstance above referred to made a deep impression upon me at the time, and has caused me to frequently say to my classes, "Be careful that you get your finger into the bladder before you withdraw the staff."

Another suggestion I should like to make is that when you get your finger into the opening through the membranous portion of the urethra, after getting it on the groove, besides this rotary motion of the finger that Dr. Rodman has spoken of, try to get it to mount the

concave portion of the staff, and let it follow this curve rather than run along the groove. If you will adopt this plan, there will be no question but that you will get into the bladder. If you attempt to get through along the groove of the staff, there is so much room in the ischio-rectal fossa that you will likely pass into this space; you will cause a displacement of the parts, pushing everything in front of your finger off the point of the staff, and you will not enter the bladder. If you will hook your finger on top of the back of the staff at its concave portion, as I now show you, it will be almost impossible for you to miss the bladder. This slight manœuvre will insure your entering it, and it should always be practised as a matter of safety or precaution. Then, when you have entered the bladder, you will feel a little gush of urine, even although the bladder may have been emptied before the operation, or you will feel the retained urine escape when your knife cuts the membranous portion of the urethra. You will then recognize the smooth membranous surface of the bladder, not the rough condition found in structures outside. When this is felt, you have the satisfaction of knowing that your finger is within the bladder.

You will find sometimes that it is not an easy matter to introduce a staff into the bladder. Compare the shape of this staff with this steel sound; note the blunt bulbous point of the staff compared with the rounded conical point of the sound; note the greater length of the grooved staff beyond its abrupt right-angle curve, and the gradual swell of the sound back of its smaller point until its size corresponds with the shaft at the bend. The sound is the ideal inflexible instrument for entering the bladder through the urethra. The curved staff is ill-shaped, and tact in skilful hands is required to avoid false passages and direct it safely to its destination. After it reaches the membranous portion of the urethra, if you are not careful, you are apt to make a false passage. Do not think that you can simply drop a staff into the bladder, because you will be very much mistaken. Take your time, and if you cannot introduce the staff otherwise, put your finger into the rectum and let the staff follow along on it to the anterior portion of the prostate. You will observe that Dr. Rodman, with all his skill, is having some trouble in entering the bladder of the patient before you.

In performing this operation the first assistant's position is just as important as is that of the operator. If the assistant does not hold the staff properly, it will be the means of making an unsuccessful operation. If the staff is improperly held, the operator is misled. For

that reason I have adhered to the old plan of hooking the staff under the symphysis pubis rather than bulging too much on the perineum, because if you have a skilled and competent assistant he can deflect it to one side or the other as may be required after you have cut through the raphe of the perineum. The perineum is a second diaphragm, and it bulges and recedes with every act of respiration.

As Dr. Rodman has indicated, hemorrhage in this operation is usually insignificant, but sometimes, in spite of all precautions, we have too much bleeding. Hemorrhage in this situation is very troublesome. Even under profound anaesthesia you have the reflexes sometimes absolutely without control, causing a funnelling of the anus and perineum, and this may be a source of annoyance in the course of the operation. It is important that the limbs be flexed upon the abdomen, as in this way the perineum is made more prominent, thereby contributing to the successful and easy performance of the operation. It is not always necessary to nick the prostate in doing this operation. Where you have a vesical calculus, or an extremely large foreign body, this is necessary; but when you are doing a cystotomy simply to put the bladder at rest, you have only to dilate the prostate, and you can do this by gently insinuating your finger into the bladder. This should be done slowly and carefully, because the parts yield in front of the finger.

There are some cases where the suprapubic operation is necessary, and in these cases you should adopt that method. Where you have an enormous prostate gland; where you have a person who is likely to be injured by excessive shock; where you want to remove, by the mixed operation of lithotrity and lithotomy, a stone; where you want to reach a papillomatous tumor; or where you want to remove a portion of the prostate gland, such an operation as suprapubic cystotomy is demanded. But whenever I am justified in doing a perineal operation I prefer it. I have had in some of my suprapubic operations such disturbance, even when I did not wound or detach the reflected peritoneum from the fundus of the bladder, or where I wounded nothing out of line, being entirely extra-peritoneal, that the condition of the intestines became alarming. I recall two cases. One was in the Louisville City Hospital. A patient was operated upon by the suprapubic method, and later developed obstruction of the bowels, which was finally relieved. I firmly believe that it was due to irritation from the suprapubic operation. I had to use the tube time and again before I could relieve the intestinal tympany which threatened the patient's life by pressing against the diaphragm and thus dangerously

disturbing respiration. Another was a case in which I operated for the relief of an immense prostate. The operation was done quickly and successfully ; the patient died, however, in forty-eight hours, from obstruction. I saw that the bowels were thoroughly drained before the operation was performed.

The operation of suprapubic cystotomy does not put the bladder at rest any better than the perineal. In the latter method, after a little while, you can remove the drainage-tube, and you have no injury to the bladder and no serious consequences ; while in suprapubic cystotomy the tendency is, in the majority of cases, to the continuance of the fistula. This feature is so marked and common that Dr. Hunter McGuire, of Richmond, Virginia, speaks of it as a permanent fistula through which the man is able to void his urine.

I think in a short time we will get the comparative results of the two operations for all conditions demanding them, and you will find that statistics resulting from the perineal operation will be more favorable than those from the suprapubic. Sometimes we are prejudiced against a particular operation and are not inclined to give it due consideration. This is erroneous, and we should give each procedure the credit to which it is entitled.

Sometimes in making a perineal section, after I get my knife into the groove, and feel certain it is there, I cut outward to make my triangular opening ; sometimes, to make it correspond to the wound in the skin, I cut backward towards the rectum. I have on other occasions incised the membranous portion of the urethra forward towards its bulbous portion and then made my dissection in that direction. One method is as good as the other, but I have always had a little fear of injuring the rectum in making my incision in that direction. The late Dr. Thompson, of Paducah, Kentucky, has called my attention to this danger in the perineal operation, and it is a fact that the knife has been stuck through the gut on several occasions ; therefore I am led to fear this complication each time I operate. I am afraid that the edge of my knife will enter the gut, and if this should occur we would have a troublesome fistula. There is no mucous membrane, even in health, that will withstand the action of urine, except that of the genito-urinary tract, and when this is abraded or injured from any cause it becomes as intolerant to urine as any other structure. If a little urine trickles through into the bowel it will produce the most violent tortina and tenesmus ; the patient will strain and strain, developing hemorrhoids, etc. ; and you will have to irrigate the rectum frequently. You will have to treat the rectum by supposi-

tories, etc., in order to protect it against this constant trickling of urine through the recto-vesical fistula. I remember having seen a case of this kind in the Hospital College of Medicine in this city where we had to keep the rectum packed with gauze for six months, during which time the patient developed many distressing and troublesome symptoms. A vesico-vaginal fistula is an easy condition to cure compared with a recto-vesical fistula.

Putting the bladder at complete rest is a wonderful curative measure. The patient before you, after perineal section, can drain his urine through a tube into a vessel outside of the bed, and will be able to sleep, not having to get up every half-hour to urinate, as he has done before the operation. What a boon it is for a man who has for a long time been in an extreme nervous state from loss of sleep! He has had to get up to pass his water every few minutes day and night. You can put the bladder at rest without any surgical procedure in the severest forms of cystitis by simply introducing a tube, and many a time have I cured cases of severe cystitis by that simple method and irrigation of the bladder.

If this man is not relieved of his bladder-symptoms, I would suggest that Dr. Rodman correct the irritation of the bladder, so far as the urine is concerned, by boric acid injections. If this does not succeed, and he still has an irritable bladder, I know of nothing that is equal to a strong solution of the crystallized nitrate of silver. Injections of a solution of sixty grains to the ounce of the crystallized nitrate of silver will often cause rapid amelioration of the symptoms of cystitis. But you will find some women whose bladders are so irritable that they cannot stand the presence of a tube until you can coagulate the albumen on the surface of the bladder and produce a condition which renders it more tolerant to the presence of the tube.

The old plan was to introduce a tube for drainage, and in many cases this method will be found to work satisfactorily. In many other cases, however, where a catheter is introduced for drainage purposes, you will find that the eye of the catheter will become obstructed by mucus and the urine will cease to flow through its calibre until you have thoroughly cleansed it by injection. If a stricture is present in the urethra, it is perhaps best to use a bougie, as by means of this instrument you will dilate the stricture and also secure drainage of the bladder. Bear in mind that in many of these cases where you have introduced a catheter into the bladder, the eye becomes occluded speedily and the urine passes out by the side of the catheter.

FISTULA IN ANO.

CLINICAL LECTURE DELIVERED AT THE KENTUCKY SCHOOL OF MEDICINE
HOSPITAL.

BY JOSEPH M. MATHEWS, M.D.,

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GENTLEMEN,—The patient we bring before you this morning is a farmer, aged thirty-seven years. Mother died of consumption. There are fourteen brothers and sisters living and in good health. His personal history is good. He began having rectal trouble about two years ago in the form of pruritus; about a year ago he noticed a hard lump near the anal orifice, which was about the size of a pea. This was not painful, and he could move it freely underneath the skin. In two weeks it disappeared with a slight discharge of pus. The swelling appeared in the same place three times subsequently, and each time it became larger than before. The last swelling was seen about six months ago. It grew very painful and large, and after three months it ruptured spontaneously, discharging a large quantity of yellow fluid. Up to the present time there has been a constant flow of pus. He does not feel pain at any time, but now and then suffers with intense itching about the anal region. This he says is most pronounced when he gets in a perspiration following physical exertion. There is a yellowish discharge that flows pretty constantly from the anal region. It is not affected by movement of the bowels, and will amount to a teaspoonful in the twenty-four hours. In consequence of this he is compelled to wear a bandage in contact with the parts to keep his clothing dry. The bowels act regularly once a day. The actions are normal in formation, and are passed without straining. There is no incontinence of fæces or wind. His genito-urinary organs, he says, are in good condition. So much for the history of this case.

In practising surgery you will often meet, for instance, a fracture, and have your ideas and impressions of that fracture by what you

have read in books, or by what you see in that one special case. The next day you may have the identical fracture that was described in your books, and when you come to examine it and treat it you will find so many points that differ widely from your first case, although it may be the same character of fracture, that the same rules cannot be applied. You may deliver a woman to-day with no trouble whatever in what is supposed to be a normal labor ; to-morrow you may be called to deliver a woman in so-called normal labor and have serious complications resulting in a speedily fatal termination. You may have one case of fistula in ano to-day that presents certain clinical aspects, and to-morrow you may have another one, seemingly originating from the same cause, that is so complicated as to make it an exceedingly difficult piece of surgery.

You may have seen me operate here upon nearly every variety of fistula in ano, and to-day we have the most difficult variety or character of fistula that has ever been presented before this class. Here is a peculiar history : there are several points that I want you to notice. Among other things recited in the history is the fact that an abscess existed for three months, then spontaneously ruptured. Now, does an acute abscess act in that way ? Do not apply the question entirely to a rectal abscess, but to an abscess anywhere in the body,— would an acute abscess remain as an abscess for three months, then open ? Not at all. Then under the old idea that obtained in former days these abscesses, which go on for a certain length of time before rupturing, were called "cold" abscesses. We know to-day that the term is a misnomer, for several reasons. One is that this character of so-called cold abscess does not contain pus *per se* at all ; the other is, we recognize in an acute abscess that its progress is rapid, pain is great, the formation of pus takes place in a few days, and you are compelled to lance it or it will break or burst. We have, therefore, plainly enough an abscess to deal with, a fluctuating cavity, with the contents true pus. But when you have this peculiar formation that is found in cold abscesses, you must know that there is something constitutional behind it. Therefore the older authorities state that this character of an abscess is due to a "scrofulous" condition. We have changed the term, they having the same idea in their minds that we have to-day, but upon modern research and investigation we know the cause, and therefore an abscess that will remain for three months without rupturing and then discharge, with the peculiar condition of affairs as narrated in the history of this case, we know is due to a constitutional cause. As you have often heard me say before, what are these constitutional

causes? Why is it that a man will have one abscess after another, lasting for one to three months, without rupturing, around the rectum? There is but one condition to be borne in mind in making the diagnosis, and that is tuberculosis. It is true that a man may be run down in health, in an anæmic condition, and the tissues surrounding the rectum, not receiving their normal amount of blood and nutrition, would possibly be put in a condition that would not resist the rapid inflammatory action, and consequently go on after a time to the formation of pus or a muco-purulent or sanguous discharge,—serum, if you please; but ordinarily you would have what you call a healthy person, a man vigorous in strength, of good color, with a good family history, giving no evidence of disease in any way, except this abscess, and you are thrown off your guard, because you see no evidence of tuberculosis in this man in any way. He is in his usual health, he carries about his normal amount of flesh, his appetite is good, his vigor is first-class, and you see no reason to suspect that he has any constitutional disease. Well, you may say that he has not yet a constitutional disease, because the foci are in and around the rectum, producing this condition of abscesses that you have read about.

The clinical features of this case are that the man has had a number of abscesses. That immediately teaches us that the case is a complicated one. One abscess, especially an active or acute abscess, might discharge pus and leave only one sinus. But multiple abscesses suggest to you that there has been a burrowing of pus out into the tissues, and the pus has discharged at many points. Secondly, this man has not, nor does he now, suffer any pain. We have, you see, an abscess that is not painful, and lasting a number of days, weeks, months, and you can safely say that this so-called chronic condition from which he suffers is tuberculous. But as I say, clinically, we have here multiple abscesses, we have a number of sinuses, and we have also that peculiar condition which has been designated or called by the authorities a horseshoe fistula; meaning, in other words, that we have an opening or openings in each side that lead to the buttocks, that communicate with the bowel, and running around through the perineum, resembling the shape of a horseshoe. You will at once understand, then, in operating upon this patient, it will be necessary, perhaps, to divide the sphincter muscle more than once to cure the fistula. Now, what are we to do? I want to warn you again in regard to operations upon this class of patients. If you will take this man, who suffers no pain, only the inconvenience of a discharge that we recognize as a fistula (and we also know that the fistulous tracts are increasing), he is

willing to say and does say to you, that he would rather go through life as he is than to have you do him any damage ; meaning by that he does not wish you to destroy his sphincter muscle. Therefore I will say to you that I will divide this man's sphincter muscle but once at this sitting, even if I find the condition calls for it. It may be possible, however, to cure this horseshoe fistula, to cure this man of this troublesome affection, even granting that the fistulous tracts on each side communicate with the bowel beyond the sphincter muscle. I will divide the sphincter on one side only ; I will trim out the channels thoroughly ; I will cut off the edges ; I will curette the surfaces, and, on the other side, rather than damage the sphincter muscle by dividing it, I will go down by the side of it and lay open the channels running up through the different sinuses and divide them, trimming the edges and curetting ; but, understand, we will simply go down by the side of the sphincter, recognizing, however, that there is an opening into the gut. Now, it may be claimed that the inflammatory action set up by this procedure will cure or heal the internal opening. If you will notice, there are two openings on each side of this man's gut,—two openings in the right buttock and two openings in the left. We will try with this grooved director to see whether it penetrates the bowel, or goes down simply to the mucous membrane, or runs out into the tissues. You see underneath there is an extensive condition of excavation ; you will notice I can run my probe into a cavity which represents a circumference of two and one-half inches, the probe falling rapidly, going into or towards the bowel itself. Anointing my finger with vaseline, I introduce it into the rectum to see whether the grooved director has gone into the gut. I find an internal opening with my finger and the probe enters just beyond the sphincter muscle. I catch it on the end of my finger, and taking my knife I make a free division. We have encountered a large artery, which we catch with forceps to control the hemorrhage. The sphincter muscle, as you will observe, now hangs on the grooved director, and with my knife I will divide it. We have secured the large artery spoken of and divided all the tissues held by the grooved director. We will now trim off the edges ; you will see the folds of skin representing a circumference, as I said, fully two and one-half inches. These we will trim off thoroughly so as to give free vent to the discharge. I want to remind you of the fact that, although the probe has been passed down into the bowel, we must introduce the grooved director backward to see if there is any excavation. You see there is, and I can place my finger well out into the broken-down tissues. Therefore it is our duty to

divide them. I find these tissues are in a necrosed condition, and we will continue to trim the edges to get a smooth, even surface before we curette the parts.

We will now pursue the same steps in examining the other side. The probe being introduced into the sinus goes down towards the bowel, and we will see whether it enters the gut at any point. You will remember I said I would not divide the sphincter muscle twice. I find the probe enters the bowel at a point just external to the sphincter muscle. You will observe that it enters the internal opening at that point, consequently the sphincter is not engaged. We will make a thorough division of the tissues just as we did on the other side. I will also examine backward to see whether there is any excavation or sinuses, and if any are found divide them. The tissues are hard and indurated, and the cavity extends back about one and one-half inches. The edges have been carefully trimmed. We will search for additional sinuses, because if you leave one the wound will not heal. We find a sinus running up towards the perineum over an inch long which we proceed to divide, and in doing so encounter another large artery which bleeds freely. Here is a large flap of skin which will simply be hanging constantly into the wound and prove an impediment to the healing process, therefore we trim it off. We will again examine to see whether there are additional sinuses. I find a small one in the top portion of the wound. This is divided and, of course, leaves more hanging tissue which we trim away. We will now irrigate this large wound with the solution of bichloride of mercury 1 to 5000, then proceed to curette the entire surface because of the necrosed condition of the tissues. You see it resembles mortified flesh. We have now thoroughly irrigated the wound, and you can see there is a ragged condition left, consequently we will resort to more trimming so as to get a clean open surface. The tissue is of a bluish color, showing want of vitality. The trouble usually is not that you do too much cutting in operating upon fistula in ano, but you ordinarily do too little, which accounts for the bad results that are often obtained in these affections. We find indurated tissue in one part of the wound which resists the curette; it will not resist the scissors, so we use the latter in trimming it out. The wound has been thoroughly curetted, and we find another little sinus beneath the skin, which, if left, would prevent the healing process, therefore we will make another incision and trim off the edges as we have done in the other sinuses.

I would caution you, gentlemen, never to be in a hurry, especially in operating upon cases like this; it is better to complete it at one sit-

ting than to be forced to do a second operation. We have a large open wound which will give us perfect drainage, and every channel has been divided, trimmed, and curetted. There is no reason, then, why this man should not get well of this very troublesome affection. It has been necessary to scarify the bottom of the wound at one point on account of the induration, and the entire wound has been again irrigated.

I wish to make one more point while the patient is being dressed, as it will give you a more accurate idea as to what fistula really is. This is a horseshoe fistula upon which I have operated without dividing the sphincter muscle twice, although I have trimmed away a great deal of tissue and gotten down to healthy structures, and am sure this man will be cured of his affection. Now you might ask me why I suppose this man will be cured of this fistula when I did not divide the sphincter muscle on the right side? A casual observation of the wound will show you why. It will take nature a long time to fill up the amount of tissue lost, consequently the deposition of lymph will tend to close the small opening which extends through the mucous membrane only and it will be filled up along with this plastic deposit that it takes to fill the wound itself. I have seen many cases of fistula of this kind where it was not necessary to divide the sphincter muscle more than once. Every channel has been traced and laid open, the surface curetted, the overhanging edges trimmed away, and the wound will now be dressed in the usual manner. After irrigating with the bichloride solution (1 to 5000) iodoform gauze will be placed into the wound carefully, not packed tightly, over this sterilized cotton, then the ordinary roller bandage. We will leave forceps on the severed artery so as to be sure to control the hemorrhage. We will take the precaution to put a little gauze into the anus, because, notwithstanding the sphincter muscle has been divided on one side, the muscle on the opposite side is intact, and we will get sufficient pressure upon the gauze to control any hemorrhage that may ensue.

Now, gentlemen, as I have said to you many times, apply this case to your private practice; all men and women are liable to have a fistulous condition as serious as this. You see it is a pretty formidable operation. As I once said to you, and as all of you know who have read Dr. Allingham's most excellent book, he makes use of this remark: "It requires more careful and delicate surgery to effect a cure of a complicated fistula in ano than any other disease of the human body." The more I operate for this condition am I persuaded that he is correct. Every case is an individual case. How much mis-

taken one would be after reading the following description in some book, "introduce a grooved director into the external opening, push it into the bowel, catch it on the finger, follow it up, and divide with your knife all tissues caught on the grooved director," if one regarded this as the complete operative procedure. You see it would not apply in the case before you, as it would leave the man in a worse condition than he was before. As a rule, all fistulæ in ano, after operation, heal by second intention. Langé, of New York, should be given credit for an operation by which he claims to heal fistula in ano by first intention. There are a few exceptional cases where primary union will occur. If you have one main channel, or if you have to deal with the original abscess, and lance it early, then by an incision later opening the entire tract, no matter how long it may be, you can curette, bring the edges together with catgut sutures or silk, and get union by first intention. But in the vast majority of cases that come to you there are additional channels, and, consequently, if there is a single one overlooked and you do not divide it, you cannot possibly get union by first intention. Moreover, if the major portion of the wound did heal in this manner, you have still left a fistula in ano in the remaining part; consequently, after you have done a number of operations and read all that the books have to say about these operations, you will come to the conclusion that there is really but one surgical procedure for fistula in ano,—I mean by that but one operation that as a surgeon you would care to perform. At the same time you split the original channel, you must follow up the other channels. You will see that all the proposed methods, elastic ligature, fistulatome (brought out by myself), and many other methods proposed are utterly futile for the cure of a case of this kind. Therefore, instead of wasting your time in cases of fistula, chloroform your patient, after thoroughly preparing him for the operation, then operate with the knife. Just here I want to say to you that, notwithstanding we have taken a great deal of time to do this operation, notwithstanding that I believe I found every channel, after dividing, curetting the bottom and trimming off the edges, getting out all the diseased tissue, I say this man may yet have a channel somewhere that has been overlooked, and he will not be radically and practically cured of the fistula, though I firmly believe he will. I simply say this to you that you may have it in your minds when you operate upon bad cases of fistula in ano that the patient will come back and complain that he has not been cured; that he has more pain than before the operation, etc. While you may have cured nine-tenths

of his trouble, still he does not give you credit for that. Why is this? Because the man originally claims to have suffered no pain, at least very little, and no inconvenience except the discharge from about the anus from the several sinuses, and if you left one channel and he still suffers with a discharge (that is what he complained of originally) he thinks he is back in his former condition; but he is not, as a matter of course: you have eradicated perhaps fifteen or eighteen different channels while he now suffers with only one, but that one is discharging, which gives him the impression that he is not cured. Regardless of the fact that you may tell him that he is almost rid of the disease, that whereas he formerly had nineteen or twenty fistulous tracts and all but one of them are gone, you will have a hard time to convince him that he is not in as bad condition as he was before you attempted the operation.

CHANCRES OF THE BREAST.

CLINICAL LECTURE DELIVERED AT THE ST. LOUIS HOSPITAL.

BY ALFRED FOURNIER, M.D.,

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GENTLEMEN,—While syphilitic lesions of the breast are seen in both sexes, they are much more rare in man. When they occur in women they are usually secondary to labial lesions, and are classed among the extra-genital chancres. There are on record, however, six cases of chancres of the breast occurring in men, and they were always produced in the same way,—by the suction of a woman's mouth.

The symptoms of the lesion when found upon the breast do not differ in any respect from those of similar lesions found elsewhere, except that in this position a chancre is more apt to be mistaken for herpes, which is very apt to appear on the breast as a result of the irritation produced by the clothing. The differential diagnosis should not be difficult, as herpes is always much more confluent than chancre. There is an absence of any induration around the eruption in herpes, and there is an absence of any axillary involvement. Certain it is that if in herpes axillary adenitis occurs, it is not symmetrical, it is not painless, and it does not involve the whole chain of glands.

Etiology.—Among women mammary chancre may occur either on those who are not nursing or on those who are. The first group is not nearly so numerous as the second, and the cause is easily explained. In the former group the contagion is carried directly to the breast by a mouth infected by mucous patches. Ricord has aptly called this condition "contagion by the adult baby." The following case taken from a number will serve as an example of the first group. A young man who was under our treatment for numerous mucous patches in his mouth did not allow himself to have connection with a woman whom he had the opportunity of caressing, but he did apply his lips repeatedly to her breasts. The result of his attentions was the subsequent

development of an unmistakable chancre on each of her breasts. While this is the usual method of infection in this group, there are a few cases on record where the female breast has been contaminated by direct contact with the genital organs of man.

In the second or nursing women group the source of contagion is usually the child itself. More rarely the circumstances attending the unloading of the wet-nurse's overcharged breasts may give rise to syphilitic infection.

The infection of wet-nurses by syphilitic children has been frequently recorded. In the majority of cases the infants have inherited the disease. In a few cases the syphilis has been acquired after birth.

Mammary chancres have been acquired, moreover, by nurses having their overcharged breasts drawn by some male or female friend who may infect them, or, the nipple being badly formed, they have been so unfortunate as to have a syphilitic point it for them. Condé, in 1820, wrote of some fifteen cases of syphilis arising in Tourcoing from a woman who claimed to be an expert at forming breasts. Nearly all of these women, so infected, gave the disease to their infants, their husbands, and their older children; while the household utensils, the drinking cups, etc., became sources of contagion, and an epidemic of syphilis was thus inaugurated.

The symptoms of mammary chancre do not differ from the lesion found elsewhere; but the attending physician should be prompt to recognize the disorder, and avoid every possibility of mistaking it for something else, in order to prevent unpleasant medico-legal complications. Great care is necessary in the selection of a wet-nurse, and the physician should not decide too hastily on the qualifications of an applicant for such an important post. While the lesion attacks both breasts, showing no preference for either, it is most commonly found at the base of the nipple, just where the areola commences. Chancres on other parts of the breast are very uncommon. The period of incubation is from three weeks to a month, just as it is elsewhere.

As the earliest possible recognition of the lesion is of vital importance, it is well to consider the initial forms in which it may appear. 1. The first indication of the ulcer is a very slight round elevation of the skin like a small bean. 2. This area becomes of a dark reddish color with rather a hard border. 3. Finally, the centre of this reddened area undergoes rapid desquamation, and an ulcerated spot appears, at first no larger than the head of a pin. In this early stage of the lesion it is practically impossible to form a positive diagnosis, but any sore of this character about the nipple of a nursing woman should

at once excite the suspicions of the attending physician. By promptly recognizing the disease, much harm may be avoided.

In the fully developed state chancres of the breast may present themselves in several different forms. There is first the scabby or crusty form, as shown in Fig. 1.

This is a rare form, as an epithelial covering cannot easily form over a surface that is being constantly moistened by the milk from the breast and the saliva of the nursing infant. In nineteen cases out of forty the breast-chancere was an open lesion with the following characteristics. The lesion was small, rounded in outline, about the size of a dime, and presented a distinct demarcation from the healthy surrounding skin. The edge of the ulcer was slightly raised above the surface. Sometimes the lesion is quite smooth, presenting a somewhat varnished appearance, and is of a dark muscle-red color. It rests upon an indurated base which can be readily felt by the fingers. Sometimes this induration is thin and parchment-like, but it is more often dense, and always decided. There is but little discharge from the ulcer, which exudes rather than suppurates. It is painless and sluggish. The lymphatic glands which are secondarily involved in this lesion are found along the lower border of the pectoralis minor muscle. This lymphatic involvement resembles that which is found in the groin when there is a chancere on the penis, only the individual glands are not as large. This is the characteristic chancere of the breast, but many different varieties of the lesion will be met with.

This erosive or ulcerating lesion, as above described, may occur in one of three different forms: (1) the papillary or raised form; (2) the irregular form, in which the healthy skin is partly surrounded by the lesion; and (3) the deeply-hollowed-out ulcer with a multicolored base. These lesions may have a horseshoe shape, or follow the outline of the capital letter C, or occur in fissures. This fissured lesion may so far undermine the nipple as to cause its complete destruction. In size they may vary from a few millimetres in diameter to that of a silver dollar. There may be only one lesion or there may be several. Beurmann has described a confluent or multiple herpetiform variety (see Fig. 2), and this observer has seen as many as twenty-five lesions on one breast. I have on several occasions counted as many as twelve. These lesions may be very small, and may be simple epithelial exfoliations. This form yields more promptly to treatment than do the others, and the symptoms are altogether milder. On the other hand, in the phagedenic form (see Fig. 3) the ulcer may be very large and deep.

The evolution and duration of these lesions are similar to what they



FIG. 1.—The crusty form of breast-chancere.

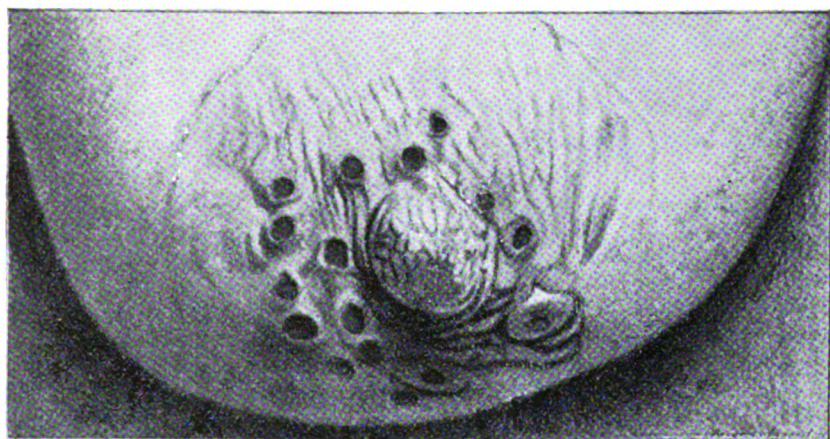


FIG. 2.—The confluent or multiple herpetiform variety of chancre of the breast.



FIG. 3.—The phagedenic form of breast-chancere.

would be elsewhere in the body. Frequently the induration around the sore is present for weeks. Sometimes it disappears in eleven days. As a rule, a cicatrix remains to mark the site of the lesion, but in many cases not the slightest trace of one remains. Therefore the absence of induration or a cicatrix does not necessarily exclude the possibility of syphilis when a case is examined some months after supposed infection.

Diagnosis.—The greatest difficulty is encountered in recognizing the lesion in its initial stage, and in deciding whether or not a given lesion is syphilitic. For example, a physician may be called to see a woman who is acting as wet-nurse to a healthy infant, and he finds that she has a small sore on one of her breasts. If he pronounces the lesion syphilitic, the nurse will at once lose her position. If he does not so pronounce it, and the case later proves to be true syphilis, the innocent child has suffered for his mistake. In such a case it is well to review all the possibilities and make a diagnosis by exclusion. Often, however, it is impossible to establish a correct diagnosis in the first few days of a breast-sore.

The diseases which might simulate a chancre of the breast are impetigo, acne, herpes, wounds and fissures from the teeth of the nursing child, eczema, epithelioma, and Paget's disease of the breast.

Fissures of the breast are very common, and may possibly mask a chancre. In arriving at a differential diagnosis any induration at the base of the lesion should be carefully looked for. A fissure should bleed more freely than a chancre, and the latter should be painless. In case of doubt the nurse should be removed from the child for eight or ten days and kept under constant observation. If the lesion is a chancre, unmistakable symptoms will develop during that time; while, if the lesion is a fissure or herpetic, it will yield promptly to local treatment alone. Meanwhile the infant can be fed with sterilized milk, and the engorged breasts of the nurse can be relieved by some form of pump or a young suckling animal, if one can be found. Eczema should be easily recognized by the diffused character of the lesion and the absence of induration and lymphatic involvement. An epithelioma should be recognized by its more prolonged course and the slow involvement of the lymphatic glands. In Paget's disease of the breast, the gradual development of the lesion and the absence of all specific manifestations, including the absence of lymphatic involvement, should establish the diagnosis and prevent any confusion. Werhouse, however, cites a case of Dr. Snow's, where a chancre of the breast was found in a so-called case of Paget's disease. Occasionally the phagedenic form may be mistaken for a broken-down gumma.

The prognosis is as favorable for this lesion as it would be if the chancre was situated on the penis. The severity of the case will depend upon whether it has been neglected or not and upon the general condition of the patient. In poor women, who have been badly fed, and who have just passed through all the pangs of labor, the outlook is not very good. In the otherwise healthy and robust the prospects for ultimate recovery are excellent.

The importance of the early recognition of this lesion, in a position where it is not apt to be suspected, cannot be overestimated. That such a lesion may effect untold harm by giving the disease to a number of others is easily shown by a reference to the literature of the subject. Besides the epidemic which has already been mentioned, report has been made of a small locality in Italy, where, out of a total population of three thousand, three hundred cases of syphilis were caused by a single breast-chancere. I have myself reported the case of a wet-nurse who infected the infant she was attending. It brought a chancre to the lip of its mother, its grandmother, and two virgin sisters. The wife, in turn, conveyed the disease to her husband. Thus there were six victims in one family. In a small town in France fourteen persons were infected through one breast-chancere, and four of them died.

In regard to the treatment there is little to be said, as the method to be followed for breast-chancere differs in no way from the treatment of similar lesions found on the genitalia. Mercury is, of course, to be given, and the treatment followed vigorously for at least three years. Any woman who has had a breast-chancere should never nurse an infant again, unless the child is from syphilitic parents.

Gynæcology and Obstetrics.

STRICTURE OF THE RECTUM FOLLOWING AN OPERATION FOR HEMORRHOIDS; PROLAPSE OF THE LIVER.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON MEDICAL HOSPITAL.

BY E. E. MONTGOMERY, M.D.,

Professor of Clinical Gynæcology in the Jefferson Medical College; Gynæcologist to Jefferson and St. Joseph's Hospitals; President of the Obstetrical Society of Philadelphia and the Pennsylvania State Medical Society.

GENTLEMEN,—This patient is twenty-three years of age; her father is living and in good health; her mother died as a result of an operation for abdominal tumor. She has had three brothers and three sisters, all of whom are living and in good health. She had the ordinary diseases of childhood, and at the age of thirteen had typhoid fever, followed by general anasarca. When fifteen years of age she fell down stairs and fractured her skull. Puberty occurred at sixteen; the flow was regular, painless, and very offensive. She has never had a miscarriage. The present trouble began in the fall of 1893, when she underwent an operation for hemorrhoids. This operation was followed by a stricture of the rectum. She underwent an operation for the stricture, and subsequently has had no control over defecation. Since the last operation she claims that, when the stools are liquid, faecal matter passes through the urethra. During the last two months she has had constant pain in both inguinal regions, radiating from the back; headache, chills, followed by cold sweats; considerable difficulty in the evacuation of the bowels and frequent urination, with marked vesical tenesmus. She now has some pelvic inflammation, as evidenced by a mass of exudation at the side of the uterus. We are unable to say definitely that she passes faecal matter through the urethra, as no indication of it has been observed since she entered the house. There may be a small fistulous opening low down in the alimentary canal, through which evacuations, loose or thin, may enter the bladder. Ordinarily we would feel it necessary to do an abdominal operation in

order to relieve this pelvic inflammation, but as this patient is suffering from stricture of the rectum, I feel that the first consideration is to treat that condition, and our treatment to-day will be directed to its relief. I should judge from the appearance of the parts that Whitehead's operation was done for hemorrhoids, and in this case the stricture resulting illustrates the importance of exercising the greatest care in the performance of such an operation to prevent the development of a more serious condition. In this statement I do not propose in any way to criticise the method of the previous operator, as we cannot tell what conditions existed. There may have been disease in this patient subsequent to the operation, as some inflammatory trouble or tubercular ulceration of the rectum, which would result in the formation of such a cicatrix. The fact that the patient suffers from the stricture and there is a history of an operation having been performed would lead us to infer that the stricture had originated as its result. The Whitehead operation consists in cutting through the junction of the skin and mucous membrane, dissecting out the varicose veins, removing the surrounding tissue, and securing union of the skin and mucous membrane by sutures. In many cases this method of procedure is a quick and effective means of relief.

As a preliminary to the operation we will wash the parts thoroughly and turn the patient about in order to show you the condition of the external parts. As I pass the finger into the vagina I am enabled to determine the fixation of the uterus posteriorly, in a state of retroflexion. This retrodisplacement of the uterus is one of the causes of hemorrhoids, it complicates the recovery from any operative interference, and we might readily suspect the condition here found to be a sequel. It should be the rule not to operate in cases of rectal disease until such a malposition of the uterus has been corrected. In this patient we have a retrodisplacement of the uterus, in which the parts are fixed by extensive adhesions. It becomes a question to consider how this may be overcome. Does the existence of these adhesions indicate the absolute necessity for a sacrificial operation? The work of Polk has demonstrated that in many cases, unless there has been destruction of the tubes and the formation of pus cavities, the mere tearing up of adhesions, setting free the ovaries, and fixation of the uterus and organs in a normal position result in a resolution of the inflammatory condition and the entire relief of the patient without mutilation. You will often be asked, however, if it is absolutely necessary that an abdominal operation should be performed or if any operation for opening the abdominal cavity is absolutely necessary. In many of these patients

the inflammation is of an adhesive character, in which there is an absence of pus in the tubes and ovaries, or pus collections in the pelvic cavity, and when the parts are subjected to manipulation by which the bands of adhesion are stretched or broken, the process of resolution and increased activity of the circulation is engendered through which the inflammatory troubles disappear. The manipulation necessary for this is that which is known as the Thure-Brandt method, or that of pelvic massage. This plan of procedure in many cases is capable of removing inflammatory exudations, releasing organs which were firmly fixed, establishing resolution and the relief of pain and distress, and restoring the function of the parts. You can appreciate the advantage of any such procedure which affords the patient an opportunity to escape a mutilating operation that precludes subsequent procreation, in many patients taking away every sweetness and comfort in life. It is a fact well known as a characteristic of human nature that we appreciate most that which we no longer possess, and though the individual may have had no special desire for children, let the childbearing function be taken away by the removal of the ovaries, and from that time she will feel that their presence would be her greatest blessing. This operation and plan of procedure, however, is not one that can in every case be safely practised, particularly if there are collections of pus, either in the tubes, in the ovaries, or in the pelvic tissues. Even the existence of pus, however, does not indicate the absolute necessity for the sacrifice of organs or the opening of the abdominal cavity. A collection of pus in one tube may be evacuated through the posterior wall of the vagina, the pus-sac reached and opened, the cavity thoroughly irrigated and subsequently packed with iodoform gauze, thus bringing about a healthy granulating surface, by which the pus-sac may disappear and the organs be retained. This, of course, may not lead to complete restoration of the affected organ, but it permits the patient to retain her ovaries, her hope of having offspring, and in some cases, possibly, through the restoration of the function of the other less affected tube, to the development of the power of procreation. In this patient we will not consider at present any plan of treatment as to the pelvic trouble, but direct our attention to the anal stricture. As the patient is turned about and the buttocks separated you see the rectum stands open and is surrounded by a fibrous ring, through which the point of the finger can be passed with difficulty, and to this is due the distress and discomfort accompanying defecation. I propose to introduce my finger and with the knife split up the posterior margin of this stricture, thus doing a rectotomy. Of course in doing

this I realize that I will increase the incontinence of faeces, from which she has been suffering, but this incontinence is not so difficult to bear and does not give such discomfort as does the existence of the stricture. Having incised the stricture, I propose to prevent its redevelopment to so marked a degree by introducing sutures from above downward, bringing together the mucous membrane and the skin. This is done with catgut, and it elongates the stricture to the extent of the length of the base through which we have cut. We have used catgut sutures in order to obviate the necessity for their subsequent removal. Bringing the healthy tissues together decreases the probability of cicatricial contraction and the redevelopment of the stricture. As the patient is turned around again you see the enlargement of the orifice, which should give her very marked relief. We cannot, of course, claim that there will be no subsequent contraction. It is quite probable that in the course of time this canal will again become contracted, requiring either dilatation or another operation. I will introduce a gauze tent, carry it up into the bowel, which will keep the faecal matter from contact with the surface, and also afford a chance for the passage of gas.

PROLAPSE OF THE LIVER.

The next patient is brought us by Dr. Sibbald, of Wissahickon. She is thirty-nine years of age, has had seven children, the youngest fourteen, and menstruated first at thirteen. She complains of a sense of weight in the pelvis, particularly upon the right side, and has at times in the same locality considerable pain. She has recently recovered from an attack of acute Bright's disease, which lasted about four weeks. Some four years ago menstruation decreased, and since then the intervals are from six to seven months. Sometimes she is regular for three or four consecutive months. She menstruated last one month ago; the flow is always painful, usually lasting one week, is quite free, and the bowels are constipated. I have not had an opportunity to examine her.

As she lies before you on the table, with the abdomen exposed, you see lines over it which indicate previous distention. These lines are known as *striæ*, indicating that the abdomen has been, at some time, distended to such a degree as to rupture the middle layer of the skin. The condition is frequent as a result of pregnancy, and, having once occurred, remains during life. It is not an absolute indication of pregnancy, as these *striæ* occur as the result of any distention of the abdomen which is sufficient to produce the skin rupture, so that it is seen in obesity, ascites, and in abdominal growths.

It is frequently seen upon the abdomens of unmarried women who are fleshy. You will notice this abdomen is symmetrically developed ; there seems no special enlargement upon either side. If there is any difference it is a little more marked at the lower part of the left side. As I made pressure over this region I recognized that this distention is due to an accumulation of gas, and, possibly, to a little increased amount of fat. A large amount of fat in the lower part of the abdomen in women is not infrequently seen. The habit of wearing corsets drawn tight with a view of retaining the shape leads to the pushing down of the fat, which must collect somewhere, and it is consequently oftentimes crowded into a large roll at the lower part of the abdomen, proving anything else than an advantage to the figure. This roll of fat, however, is not so marked in this patient. As we examine the abdomen by palpation, passing the hand from one side to the other, having the hands at one time close together, at others the entire abdomen between them, we find an absence of any induration or enlargement until a point is reached a little above the level of the umbilicus, where we find in the right lumbar region a distinct enlargement. This extends over to within two to two and a half inches of the umbilicus at the median line, where it ends. Passing upward, we find it extends to the ribs. We have, then, a mass situated in the right lumbar region. Now, our previous study of the abdomen has led us to recognize the fact that there are situated in this region the liver, the kidney, the ascending and transverse colon, coils of intestine, and the omentum. This enlargement must have developed from one of these organs. We would not expect, of course, to find an ovarian tumor with an absence of any mass below. This tumor begins above and disappears below, consequently it cannot be from one of the viscera of the pelvis. We might have an inflammatory mass in the appendix, which has increased in size and extended upward. In a history of inflammatory trouble we would expect to find some continuation of the condition into the pelvis. The mass is too large to lead us to suppose for a moment that it is any exudation or development of trouble in the colon. You remember a case which quite recently came before you in this clinic in which careful examination led us to doubt as to whether the growth was one of the colon or right kidney. The situation of the mass in the right lumbar region, its size and outline, led us to suspect the possibility of its arising from the kidney, but there was an entire absence of any history of blood or pus in the urine ; the patient did, however, present a history of an occasional discharge of blood and pus through the bowel, so the diagnosis made was a possible

sarcoma of the bowel. You will wonder why we say sarcoma rather than carcinoma ; simply for the reason that sarcoma affects the muscular structure of the bowel and does not ordinarily interfere with its calibre, while carcinoma begins in the mucous membrane, and, as it increases in size, produces a narrowing of the bowel and its consequent obstruction. There is a history of discharge of blood through the bowel, interference with the circulation in the mucous membrane, rupture of the vessels situated in the tumor, and consequently explanation of the hemorrhage, so we have no hesitancy in saying it was a sarcoma. We made an exploratory incision, found the condition as suspected, and reclosed the wound.

In the patient before us we have an absence of any history of bowel trouble. We find upon examining this patient there is a distinct, sharp edge to the lower border of this mass, and the border can be followed upward some distance. In this patient there is an absence of any history of urinary difficulty ; there is a history of having frequent evacuation of urine with some darkened appearance, but this tumor has a distinct margin, which is sharp and well defined, and projects over into the median line. We have, consequently, a growth, not of the kidney nor of the colon, but of the liver. Is this a prolapse of the liver from increased weight and relaxation which takes place occasionally from distention and loss of muscular power ? As we examine this patient we find there is a ventral opening resulting from the separation of the recti muscles, so that when she stands there is at once a protrusion of the abdominal wall, demonstrating a lack of abdominal support. While we have here some enlargement of the liver, it is possibly due to the want of support below, and has primarily been a prolapse of the organ resulting from elongation of the ligaments and prolapse of the stomach. It has recently been asserted that prolapse of the colon, stomach, and liver is more frequently the cause of pain in the abdominal cavity than diseased conditions of the pelvis, and not unfrequently many of the disturbances which patients suffer after operation are due to the dragging down of adhesions which have formed in the mesentery or omentum, giving rise to marked distress in the region of the stomach. We have, then, enlargement of the liver. Whether this enlargement is due to an inflammatory condition or simply to a slower change taking place in the organ itself, or whether it is due to prolapse of the organ, is difficult to determine, and can only be determined by subjecting the patient to close observation for a length of time in order to ascertain the presence of destructive change in the structure of the organ.

CHRONIC ENDOMETRITIS AND ADENOMA OF THE CERVIX UTERI.

CLINICAL LECTURE DELIVERED AT THE KENTUCKY SCHOOL OF MEDICINE
HOSPITAL.

BY WILLIAM H. WATHEN, M.D., LL.D.,

Professor of Abdominal Surgery and Gynæcology in the Kentucky School of Medicine ; Fellow of the American Gynæcological Society and of the Southern Surgical and Gynæcological Society ; Gynæcologist to the Kentucky School of Medicine Hospital and the Louisville City Hospital, etc., Louisville, Kentucky.

GENTLEMEN,—I have not seen this patient until this morning, and the history she gives, while it indicates that there is some disease of her generative organs, does not positively indicate any particular disease. She is twenty-four years of age, well-formed, and apparently a healthy woman, who had no trouble with her uterus or ovaries until after her marriage, four years ago. Since then she has had pain deep in the pelvis, in the right inguinal region, and finally in the lower part of the abdomen. Menstruation has been practically normal as to quantity and duration, but pain during menstruation has been greater than before her marriage ; yet she has not had any very well-marked dysmenorrhœa. In addition to the pain in the pelvis and the lower part of the abdomen, she has severe pain in what she calls the small of her back ; occasionally she has severe pain in the back part of her head ; sometimes she becomes quite nervous, and from unusual exertion of any sort, such as long walks, lifting heavy weights, assuming awkward positions, or in the marital relations, she suffers more severely. She has a profuse and constant leucorrhœa, sometimes light in color, sometimes yellow.

Having made no physical examination we cannot arrive at a diagnosis, because the symptoms she has narrated are common to a variety of diseases. No one knows so well as a thoroughly educated and experienced gynæcologist the impossibility of diagnostinating what the disease

is in a case like this until a physical examination has been made. We must always study the subjective history, just as we have this morning, because it is the only means of knowing that there is some form of uterine or pelvic trouble, and unless we suspect that there is some disease of the female generative organs, we, of course, are not justified in making a physical examination. Now the first examination I will make will be digital, in the vagina. If this is not satisfactory, I will then make a bimanual examination, with one finger in the vagina and a hand above the symphysis pubis and over one or both of the inguinal regions, so as to bring between the finger or fingers in the vagina and the hand above, the uterus, ovaries, and tubes, or any enlarged condition that may exist. Sometimes we introduce a finger into the rectum and may at the same time practise bimanual examination, feeling the structures between the finger in the rectum and the hand over the lower part of the abdomen. Or we may with the finger in the rectum introduce a sound into the bladder and examine the structures intervening, or we may first dilate the urethra so that a finger can be introduced into the bladder and examine the condition of its lining membrane, or with the finger in the rectum, and a finger in the bladder, we may examine the intervening structures. We may introduce a speculum into the vagina, and expose the neck of the uterus, and if necessary introduce a sound into the uterine cavity; but a sound should not be introduced unless we are unable by any and all other means to make a correct diagnosis, for the reason that it is one of the most dangerous of all forms of examination, and more diseases have resulted from its use than from all other methods of examination. Infection of the uterus, or of the tubes and cellular tissue in the pelvis, resulting from the improper use of the sound, unfortunately, does occur occasionally, but if the sound is employed by a person who is judicious and careful in its use and always cleanly, there need be no trouble. The sound should never be introduced through a vagina that has not been made sterile, unless you expose the neck of the uterus by means of a speculum, so that all the secretions can be wiped away and the sound introduced, after being made aseptic, without coming in contact with any of the vaginal secretions or with any part of the vaginal wall. Occasionally the sound gives valuable information, but the more experienced we become the less we will use the sound, because other means will enable us to make a diagnosis. So that a diagnosis is made on the subjective history, the sense of touch, the sense of sight, the sense of hearing, and the sense of smell.

I will now make a digital examination. For this examination we

place the patient upon her back in the lithotomy position, or upon her left side with her limbs flexed and the left arm behind her. In the latter position pelvic pressure is removed and your finger can feel ovarian and tubal enlargement and inflammatory exudation higher up than with the patient on her back. I find the neck of the uterus enlarged, the os dilated, with a velvety sensation over the surface of the cervix such as we occasionally find in the early months of pregnancy, and such as we may find where we have the so-called abrasion or erosion of the epithelium. Her abdomen is decidedly enlarged and so tense that I cannot press down sufficiently deep to make a bimanual examination of any value. But this enlargement, while it feels nearly as tense as a myomatous tumor or an ovarian adenoma, is certainly the result of gaseous distention and contraction of the muscles because of dread of being hurt. Usually the rigidity of the muscles may be overcome by talking to the woman and handling her in a way that will remove her fear of being hurt, and sometimes you can overcome it by continuing to press gently but firmly until you have, as it were, worn out or exhausted the contractile power of the muscles. The uterus seems to be perfectly movable and in its normal position. The neck of the uterus is too large and I believe the body is also enlarged. As she is in the dorsal position we will expose the cervix by means of a bivalve speculum. The condition proves to be, as we suspected, one of so-called erosion of the cervix. As I am unable to get the patient to let me make a satisfactory bimanual examination, I will make an examination with the sound and see the exact position and depth of the uterus. We will wash the sound thoroughly, then dip it in ninety-five per cent. carbolic acid before its introduction. Now the sound is introduced to the fundus of the uterus and we find the organ in its normal position. I want to determine the depth of the uterine cavity, and the method I will pursue is by placing a dressing forceps against the neck of the uterus and withdrawing the forceps and the sound together. We find the depth to be three inches. We have then in this case the so-called abrasion or erosion of the neck of the uterus, with the uterus not much enlarged, except the cervical portion, and of nearly normal depth, with, so far as we are able to learn, no disease of the Fallopian tubes or of the ovaries, at least we can find no enlargement of these structures, and we can find no adhesions; however, with chronic inflammation such as we have in this case, where the disease extends up the endometrium from the cervix to the fundus of the uterus, there is a probability of the disease having its origin from pathogenic micro-organisms, and having extended out into the tubes, causing salpingitis, not enough,

however, to obstruct the outer ends of the tubes or to form pus that will cause pelvic peritonitis, with exudations and adhesions. She is probably suffering from a chronic form of inflammation not only of the cervical canal and the tissue around the os, but also of the endometrium, because when the sound touches this membrane it causes severe pain, and when withdrawn there are a few drops of blood following, though it was used as gently as possible. So we make the diagnosis of chronic inflammation of the cervical canal and of the endometrium, with probably a catarrhal salpingitis.

The treatment is to move her bowels thoroughly, give her chloroform or ether, dilate the womb, and from the fundus to the cervix curette all the surface, then irrigate the cavity with bichloride of mercury one to two thousand or one to three thousand, tampon the cavity with iodoform gauze, keep her in bed four or five days, each day injecting once or twice bichloride of mercury solution, one to two thousand, into the vagina, continuing this treatment for some weeks after she gets out of bed, or until the leucorrhœal discharge disappears. If this treatment is carried out, I believe she will recover. If there is some salpingitis, from the fact that the germs are all removed from the uterus, the inflammation thereby ceasing in the uterine cavity and in the neck of the uterus, the inflammation in the tubes will probably get well. She will then not develop pyosalpinx. We cannot curette the uterus this morning because she has eaten her breakfast and is not prepared for the operation.

I spoke to you about the so-called abrasion or erosion around the cervix. These are the terms used in many text-books, and by most gynæcologists and operators or practitioners who treat these cases, but latterly it has been taught by the best authorities that this condition is sometimes a form of adenoma.

CASE II.—The next patient is aged twenty-five years; she is the mother of three children, and had one abortion five years ago. The first child was born seven years ago. She has had no disease of any kind until about a year ago, when she began having some trouble in her rectum, for which the rectal surgeon of our hospital treated her, and she says claims to have effected a cure. She now has no pain in the rectum, no pain over any part of the abdomen or inguinal regions, no pain in the pelvis, but suffers some pain between her menstrual periods in the lower part of her back. This pain is absent during her menstrual periods. There is, then, from the history, no evidence of disease of the uterus, ovaries, or of any structure of the body, the only symptom being pain in the lower part of her back,

and a leucorrhœal discharge, which is now, she says, not very much, having decreased in quantity. There is hardly enough in the history to justify us in the belief that she has any disease in her generative organs, and were she a virgin or a young girl who had not been examined, I should not examine her. I will first make a digital examination, then bimanual examination, bringing the uterus between my finger in the vagina and the hand above the symphysis pubis. The uterus is normal in size and position, there is no enlargement of either ovaries or tubes, and there are no adhesions in any part of the pelvic cavity. There is, in fact, no evidence of disease of any sort except a little velvety condition of the cervix, just as we had in the preceding case, that would indicate the destruction of the epithelial covering of the cervix. Now I will introduce a speculum and see what we can demonstrate by the sense of sight. Just as I told you, there is a little erosion of the mucous membrane around the os.

This case is one that does not signify very much in the sense of disease, because there is no disease of the body of the uterus, nor of the ovaries or tubes, nor in the pelvic structures,—simply a little inflammation of the cervical canal around the os that requires but little treatment. You may curette these cases if you see fit, confining your curettage to the cervical canal ; or you may expose the neck of the womb every four or five days and make an application, around the os and up on the cervical canal, of equal parts of Churchill's tincture or of iodine and carbolic acid, directing every day a vaginal douche with an irrigation bag, of a quart of the bichloride solution one to two thousand. This continued for a few months, if the woman will conform to your instructions, will relieve her of all trouble with her uterus and she will no longer have leucorrhœa. She says that she does not have so much discharge as she formerly did ; the raw surface is healing ; nature is apparently curing her without the intervention of art, and if she will take the proper care of herself she will probably become entirely well without resorting to treatment or submitting to any operative procedure.

ABDOMINAL SECTION FOR TUBO-OVARIAN AB- SCESS WITH RECTAL FISTULA.

CLINICAL LECTURE DELIVERED AT THE HARPER HOSPITAL.

BY H. W. LONGYEAR, M.D.,

**Professor of Clinical Gynæcology in the Detroit College of Medicine; Gynæcologist
to Harper Hospital; Chief of the Staff of the Woman's Hospital, etc.**

GENTLEMEN,—The case on which I am about to perform an abdominal section has the following history: Mrs. W., aged thirty-one, had one child seven years ago and one miscarriage five years ago. Menstruation has been regular and natural, and she says she has had good health until the present attack, which commenced about the first of December last with chills followed by fever, which continued for three weeks, when she began to have pain in the region of the left ovary, which gradually increased in severity. Has had fever more or less every day since that time. Her last menstruation was at Christmas time, and was then five days overdue. She then flowed profusely for a week, and this became so severe that her family physician gave ergot to control it. Her breasts have not enlarged, and she has had no nausea until the last two weeks. She says she has never had an attack of inflammation of the abdominal or pelvic regions before this illness, and gives no history of having had gonorrhœa. For several weeks she has had some looseness of the bowels, causing two or three daily watery offensive evacuations, without pain.

Physical examination shows cervix small, and about normal consistency; uterus in normal position, immovable, and about as large as if it were in the second month of pregnancy, and continuous with the left side of the organ is a smooth, indistinctly fluctuating tumor reaching to the pelvic wall, to which it seems closely attached. The tumor does not lie behind the uterus or very low in the pelvis, but extends upward to about the level of the crest of the ilium. The parts are all extremely sensitive to pressure, but there are no apparent signs of peritonitis. The left thigh cannot be extended without causing pain in

the side, and is consequently kept in a constant state of flexion, which condition is doubtless due to the irritation of the iliac and psoas muscles, caused by the inflammatory mass lying directly upon them. During the week that I have had the patient under observation her temperature has ranged from 100° to 105° F., some days being low during the whole twenty-four hours, and at others high during the same time, but it was observed that the low temperature followed an increased looseness of the bowels. The temperature this morning is 104.5° and the pulse 120 and weak. The patient can sit, but cannot walk because of the flexion of the thigh. Now, what deductions are we to make from the history and physical signs in this case? The first question is, "Does the history indicate a diagnosis, and if so, do the physical signs confirm it?" The first point to be noted is in regard to the patient's general condition, which is now septic, and, as the history indicates, has been so for over two months. This, of itself, would naturally point towards some infective, suppurative process, and the discovery of the fluctuating mass in the region of the left Fallopian tube and ovary would tend to indicate the diagnosis of an abscess of these uterine appendages. The diarrhoea suggests a possible fistulous opening of the abscess into the bowel. If there were a history of gonorrhœa occurring previous to the formation of the tumor this diagnosis would be almost positive, as my experience in the treatment of pelvic disease in women has taught me that this disease is the cause of nearly all cases of abscess of the Fallopian tube and ovary, the only exceptions I have ever seen being those occurring as the result of tuberculous disease. I have inquired into this phase of the history as closely as possible, both of the patient and family physician; the latter assuring me that he is positive that no gonorrhœa could be responsible for the trouble, as the husband, as well as the wife, has always consulted him about everything. I must warn you, however, that you must not bar out too completely the possibility of gonorrhœa as an etiological factor in these cases, because you fail to find it in the history, as in this case, as the disease is often most insidious in its manifestations in the female genital tract, and is often present in a mild form, its true nature not being suspected by the patient or physician until it has passed beyond the reach of ordinary treatment and invaded the uterus, Fallopian tube, and ovary, where its activity is soon made manifest by the onset of violent inflammation of the parts.

What other conditions may we possibly find after opening this abdomen? For I must tell you that positive diagnoses are not made as frequently nowadays as they used to be, when there was no danger

of immediate confirmation by abdominal section. It is possible that the abscess may be tubercular, and it is also possible that an extra-uterine pregnancy may be at the bottom of all the trouble. The menstrual history would lend color to the latter possibility. However, the main point, that of the necessity of operation, has been decided on, and so we will soon know the exact condition. Dr. Shurly is now finishing the last part of the preparation of the abdomen of the patient, which consists in scrubbing the skin, first with soap and water and then with sublimate solution, and, lastly, with sulphuric ether. As the patient is now ready, I proceed to make the incision in the median line, severing the skin and fat, then the aponeurosis, and, pushing aside the rectus muscle, I now use these fine-toothed forceps, grasping and raising up the tissues with one pair on each side, and cutting between. The peritoneum is now reached and a small opening made in it, through which I pass two fingers as a guide, and quickly enlarge the incision to its full extent. Passing in my fingers, I find the omentum adherent over the uterus and the tumor, which, with some care and following the lines of cleavage, I easily detach and pull upward. The tumor is now easily felt to be distinctly fluctuating, with the walls apparently thickened and not tense. As I feel adhesions to the intestines, I will, to facilitate my work by sight as well as by touch, place the patient in the Trendelenburg position. In this position you see the abdominal contents have now gravitated towards the diaphragm, and with the use of the retractors give me a clear field in the region to be attacked. Before touching the tumor I shall pack these three sterilized hot towels into the cavity and spread them out over the intestines to protect them as much as possible from contamination in case I rupture the abscess sac, as I am very liable to do in its removal. By the use of the retractors I am now able to see that the descending colon is doubled over and adherent to the top and outer side of the tumor, and by gentle manipulation I find that the adhesion is of recent origin and easily separated with the fingers without any damage to the wall of the intestine. On passing my fingers over and around the mass I find there are no lines of cleavage anteriorly, but posteriorly I find a weak spot, and entering it I pass my two fingers beneath the mass and well down into the pelvis, and am now separating its posterior adhesions without much difficulty. Pus now appears, which Dr. Shurly will rapidly remove as it wells up, allowing none to escape upward into the abdominal cavity, and using a fresh gauze sponge each time. The pus is fetid in the extreme, and the odor can doubtless be detected in every part of the room. Now that the contents of the sac are all pressed out and thoroughly removed, I will

finish its removal. Having separated all adhesions with my fingers, I find the pedicle to be broad and thick, extending from the iliac bone to the uterus, and composed of a greatly thickened broad ligament. It being too short and thick to ligate *en masse*, I shall tie it off in sections, cutting away each portion as it is tied, and beginning at the iliac end, as it is here that the ovarian artery enters, making it the most important section to make secure. Now, having tied and cut away these two sections, I come to this enormously thickened mass lying next to and apparently continuous with the left horn of the uterus, and as it spreads over and forms a part of the sac wall, I find I shall—to insure the complete removal of the entire sac—be obliged to cut away a portion of the horn of the uterus, which I will now proceed to do, after ligating it in two sections, the lower of which will control the anastomosing branch of the uterine artery. Now cutting this away, the sac is removed entire, which is evidently composed, mostly, of the ovary, and must have contained at least eight ounces of pus. The enlarged and empty Fallopian tube you will see running through the mass cut away from the horn of the uterus. I now sponge out the cavity from which the tumor has been removed and note that the ligatures have completely controlled all hemorrhage. With the patient in this position, I can very critically examine the rectal wall to which the sac was adherent, and through which I fear there is an opening, and now, with the assistance of the electric light, I see the perforation and find I can readily pass my two fingers through it. This I now proceed to close, using for the purpose a fine kangaroo tendon, and employing a continuous Lembert suture. As the gut is fast to the pelvic wall at this point, and well to the bottom of the cavity, the work of closure, as you see, is a little tedious. You can readily see that it would be almost impossible to close this opening without the aid of the Trendelenburg position, and equally difficult to have discovered the opening or operated upon it if the operation had been made through the vagina. Now, that the opening is closed, I note that there is no hemorrhage except the oozing from broken adhesions, and I shall now, after placing the patient back in the recumbent position and removing the towels, wash out the pelvic cavity very thoroughly with sterilized water. I do not use the water while the patient is in the Trendelenburg position, as gravitation would then tend to carry contaminated water up into the abdominal cavity, which should always be guarded against. After removing the towels, I pass my two fingers down into the cavity, and with them keep the intestines pressed upward and the abdominal wound freely open. Passing the glass tube along the dorsal

surface of the fingers as a guide, the water is directed to the bottom of the cavity, and as it wells out in a free volume, you notice that it brings many small clots and other small débris. As the water runs, I pass my fingers about and gently rub the surface of the wall of the cavity and neighboring parts. As the water now comes away clear, it may be stopped and the surplus sponged and pressed out. With my fingers still in the cavity, I pass down into it this long glass Price drainage-tube, and around it pack strips of iodoform gauze, taking care, however, not to allow either the tube or the gauze to touch the repaired part of the bowel, as nothing must interfere with the lymph deposit that, I hope, will speedily and securely seal the opening there. As this is a very septic case, I shall not follow my usual custom of closing the abdominal wound with buried sutures of kangaroo tendon, but will employ the old method of *en masse* suturing, using silkworm gut. You will notice that I am careful to pull down the omentum as far as it will come, and I now tuck it well down between the intestine and the drainage materials, which is necessary to further protect the intestines from both infection and irritation, and prevents the adhesion to the abdominal parietes at the point of incision, which often gives rise to future trouble. Now, after making fast the silkworm-gut sutures with a simple dressing of sublimate gauze and cotton, with this protector for the tube, the operation is complete. I shall, however, direct Dr. Shurly to place and retain by a suitable binder a short glass drainage-tube through the anus into the rectum for the purpose of carrying away flatus, and thus preventing any pressure on the stitches in the rectal wall. I am not afraid of fecal material, as I have in this case followed my usual custom, as in all abdominal operations, of completely emptying the bowels with saline cathartics the day previous to operation, and shall nourish her with broths only till the bowel is completely healed. The patient is now nearly pulseless, and vigorous measures must be instituted to stimulate the nerve-centres. As she has not lost much blood, I shall not resort to transfusion, but shall call upon the nervous system, as that is the weak point. You notice she is now being wrapped in a dry, hot blanket, and she will also immediately receive a hypodermic injection of sulphate of strychnine, $\frac{1}{10}$ grain; digitalin, $\frac{1}{100}$ grain, and these measures will constitute the treatment after she is put to bed, and continued until reaction is established. Heat to the surface, assiduously applied to the largest extent possible, and strychnine used subcutaneously, are two of the very best remedies for surgical shock and exhaustion. The strychnine must sometimes be used heroically, and in this case I shall

direct that the same dose be repeated every two hours till reaction occurs, or till I see her again in about eight hours from the first dose. The first danger is from exhaustion, and the second is from a continuation of the septic process from which she has been suffering for so long. By the means I have just enumerated I hope to save her from the first, and because I have removed every vestige of the cause of the infection,—which is absolutely necessary to success,—and have applied a most thorough plan of drainage, I believe she will be saved from the second danger.

MARCH 17.—Gentlemen,—I hold in my hand the chart of the patient from whom you saw me remove the fetid ovarian abscess two weeks ago. She has made a remarkably good recovery, and is beginning to sit up to-day. She had four doses of the strychnine before the pulse became very perceptible, but after the fourth hypodermic it gained rapidly in strength, although continuing very rapid—from 125 to 138—for forty-eight hours. The strychnine and digitalin were continued every four, and then every six, hours, till the end of the third day. The temperature has not risen above 100° F., and is now normal. The gauze drain was removed on the fourth day, and the tube on the sixth, there being very little discharge and no odor to it at any time. The rectal tube was retained, excepting at times of defecation, till the twelfth day. There is no sign of a faecal fistula. There is one point in the history of this case that I have had some light on since the operation, which clears up the etiology of it. You remember that I told you there was no history of gonorrhœa in the case, and yet I found an abscess of the tube and ovary, which, according to my belief, was gonorrhœal in origin, as it was not tuberculous. I was so sure of my ground that, immediately after the operation, I accused the husband of having had gonorrhœa and infecting his wife, whereupon he confessed that he had, and had concealed the fact from his family physician. He also said that his wife had deceived me about the character of the disease, as she had suffered with pain in the pelvis a long time before the fever began. The abscess was doubtless an old one, and was quiescent until infected through its connection with the rectum, when general septic infection resulted. Dr. Sargent, the hospital pathologist, has made a culture of the pus and reports the presence of the *bacillus pyogenes fetidus* and a very large variety of *staphylococcus*.

Now, gentlemen, the salient points of the lesson taught by this case—the points that I desire especially to impress on your memory—are these: (1) The value of the history of cases in the determination of diagnosis; (2) the presence of abscess of the Fallopian tube or ovary

is always the result of gonorrhœal infection unless of tubercular origin ; (3) the necessity of removing every vestige of the diseased parts ; (4) the thorough washing of the seat and surroundings of the sac, so that no nidus of infection can remain ; (5) complete drainage of the abdomen ; (6) removal of bowel pressure by the rectal tube, and (7) accuracy of technique in the details of operative work.

BARTHOLINITIS.

CLINICAL LECTURE DELIVERED AT THE TREMONT DISPENSARY.

BY CHARLES GREENE CUMSTON, B.M.S., M.D.,

Instructor in Clinical Gynæcology, Tufts College, Boston; Member of the Société Française d'Electro-Thérapie; Director of the Gynæcological Clinic of the Tremont Dispensary, etc.

GENTLEMEN,—The patient that I wish to show you at to-day's clinic presents the following history: She is twenty-seven years old, a blonde, not very strongly built, and is decidedly of a lymphatic temperament. She menstruated at the age of sixteen, and has always been quite regular, although the amount of blood lost has usually been scanty.

The patient comes to-day on account of considerable pain at the entrance of the vagina. This pain is particularly sharp when she urinates, and there is also a great deal of itching. The patient also tells us that for the last week she has been annoyed by a thick, greenish, and abundant discharge from the genital organs. Now that she is on the examination table, by separating the labia majora you will perceive that the lower third of the right labium is the seat of a tumor the size of a large walnut, and protrudes quite sufficiently to obstruct the vaginal orifice.

The mucous membrane over the tumor is red, hot, and tense, and when I seize the tumor between my fingers I feel that it fluctuates distinctly.

By pressing the urethra from behind forward you will notice that a drop of bright yellow pus comes out from the meatus. The vagina is also red and hot, and a considerable quantity of greenish-colored discharge covers the walls. The cervix as yet presents nothing abnormal.

Let me add, gentlemen, that the patient can neither walk nor sit down on account of the severe pain which she experiences, and it was this great suffering which has been present for the last three days that has led her to come to the dispensary to seek advice. We are, there-

fore, in the presence of a comparatively frequent disease, and, on account of its importance as well as the superficial way in which it is treated in the majority of your books, I would like to dwell upon it during the remainder of the hour.

The patient is the subject of a gonorrhœal inflammation of the vulvo-vaginal glands, or, as I prefer to call it, a bartholinitis, because these glands were described for the first time by Gaspar Bartholini in 1677, and the term appears to me a short and precise one, consequently I have adopted it.

These glands number two, one on the left and one on the right, and are situated in the lateral and posterior part of the vagina at about a centimetre above the lower orifice of this canal. They are between the superficial and middle aponeuroses, and partly lie in the angular space which is formed by the contact of the vagina and rectum. The size of these glands varies from that of a pea to an almond. They are oval in shape, slightly flattened in the transverse direction, and measure from about twelve to fifteen millimetres in length and from about eight to ten millimetres in breadth. Their weight is about four or five grammes. They are in relation above, forward, and inward with the bulb of the vagina; below and within nearly in contact with the inferior branches of the hemorrhoidal veins. Outwardly they are limited by the ischium. Behind they are in relation with the middle aponeurosis of the perineum.

When sufficiently developed they have a rosy color, and are composed of lobes and lobules, which are disseminated in the neighboring tissues. The lobules open into sinuses, from which some canaliculae pass, and which, in their turn, open one into the other, and finally at the end of the gland they form a single excretory duct.

This duct is about two millimetres in breadth and about a centimetre and a half to two centimetres in length, and is directed obliquely from above downward, from behind forward, and from without inward. Its orifice, which is round, is usually found at about the middle of the orifice of the vagina, or at the junction of its lower third with the two upper thirds, in the sulcus separating the labia minora from the hymen or its remains.

This orifice, which is normally very small, hardly even visible, is in certain cases very apparent and large enough to allow the introduction of a small probe. It is usually surrounded by a very red, vascular circle, which distinguishes it from the surrounding parts.

According to some writers, this external duct of the gland may be double.



FIG. 1.—A case of right-sided bartholinitis.

The arteries which supply these glands come either directly or indirectly from the internal pudic by means of the artery of the bulb. The veins, which are more or less plexiform, lead into the pudic and partly into the venous plexus of the vagina and the bulb.

The lymphatics connect with the glands situated on the sides of the vagina and the rectum, and from there pass into the inguinal glands.

In the child the vulvo-vaginal glands are very small, but they increase rapidly in size at the age of puberty, and have their maximum of development in adults. However, the functions of these organs are only slightly developed before puberty, and this functional calm, as well as diseases of this apparatus, are in perfect relation with its slight degree of development in the child. But as soon as the sexual functions come into play these glands take on activity. The liquid which they secrete is thick, sticky, rather oily, and as clear as crystal, and presents all the physical and chemical properties of mucus.

Tiedmann is certainly wrong when he says that this liquid secreted has a dirty-white color, and I think that it is safe to say that it would only present this aspect when there is some pathological change in the gland or in its excretory duct. The mucus has several physiological uses. In the first place, it renders coitus easy and maintains the moisture of the part during the entire act. On the other hand, it preserves the orifice of the vulva against the irritating action of the genito-urinary secretions. As to the opinion of Biuschke, who pretends that this liquid is a physiological aid in labor, I have nothing to say, although it would appear to me that there is a sufficient number of other glands which become functionally active at this time, and that the organs under consideration would yield far too small an amount of liquid to be of any decided importance.

When a woman has lost her sexual functions the vulvo-vaginal glands become atrophied, and their function is lost little by little as the sexual activity dies out; consequently all diseases of these glands are very infrequent after the menopause.

When, under some influence, there is a change in the physiological condition of an organ, we may say that this organ is in a pathological condition. Now Bartholini's glands are, by their situation and their structure, exposed to a large number of circumstances which favor the development of the diseases of which they may be the seat.

As we have seen, it is only about the time of puberty that the gland is developed, and that it is subject to disease. According to Neumann's statistics, it is from seventeen to twenty-three years, and, according to Huguier, from eighteen to twenty-seven that the disease

of this organ is most commonly met with. They are rarely in a diseased condition before the age of fifteen years and hardly ever after forty-five.

It has been said that blonde, and especially lymphatic, women are more easily attacked by suppuration of these glands than others. I have certainly noticed that these women are more subject to whites, and that swelling of the lymphatic glands is certainly of more frequent occurrence in them than in brunettes.

All circumstances which may stimulate or produce congestion of the genital organs, and especially the vulva, are frequent causes of bartholinitis. As, for example, masturbation, labor, excessive coitus, and, exceptionally, a considerable disproportion between the genital organs of the man and those of the woman.

You will consequently understand that the members of the *demi-monde* are more subject than all others to this affection.

Pregnancy and the menses produce a passive congestion in these glands, which I believe may also be a factor in the production of the disease which we are discussing, but, according to Huguier, pregnancy appears to more often produce irritation and inflammation of the isolated mucous follicles than of the vulvo-vaginal glands. As to the influence of menstruation, when it is being established as well as when it is disappearing, it is evident that it plays a part in the formation of these abscesses, and the disease that was thought to have been cured recurs when the menstrual period returns. I will explain to you more fully the *rôle* of these congestive factors when I speak of the pathological anatomy.

One of the most frequent causes of bartholinitis, especially that form which we most often meet in hospital practice, is gonorrhœa. Some authors have even gone so far as to hold that bartholinitis is always due to gonorrhœa, but this, I am sure, is a mistake, for I have met with cases in which no trace of gonorrhœa could be found, and, in the pathological reports of examinations made on these glands, the gonococcus has never been the *only* organism found.

Climate does not appear to have any particular effect in the production of bartholinitis, but it is curious to note the influence of the seasons on this disease. I think that spring and the end of summer are the times at which it is most frequently met with, and the months of May and September are the most propitious for this disease; but, gentlemen, I do not think there is anything absolute in this,—it is simply what I have observed,—and I mention it more as a curiosity than anything else.

In all the statistics of bartholinitis this disease is more frequently found on the left than on the right side. Huguier found it twenty-one times on the left and twelve times on the right; Neumann, one hundred times on the left and eighty-eight times on the right. Out of seventeen that I have seen it has occurred eleven times on the left and five times on the right, and in one it was bilateral.

This greater frequency on one side is not purely a coincidence, and, although a perfect explanation of this fact has not as yet been given, several hypotheses have already been brought forward in order to bring some light on this point. Let me mention the reason already given for explaining varicocele and varicose veins of the left side,—that is to say, the compression produced by the sigmoid flexure on the left iliac vein. Another explanation which has been given by Malgaigne is that in coitus right-handed men press more towards the right and consequently rub on the left side of the vulva.

In a work by Dr. Alary on the etiology and treatment of abscesses of the vulvo-vaginal gland, I noticed that the author opened his work by a discussion on the gonococcus, and, in the first place, he states that the specific micro-organism of all gonorrhœal infections is, without doubt, Neisser's gonococcus.

I can make no criticism on this assertion, but when you find it placed at the beginning of a work on bartholinitis it consequently indicates the ideas of the author regarding the etiology of this disease. According to him, an abscess of the vulvo-vaginal gland is a gonorrhœal affection, while, according to Buton, it is a secondary manifestation of syphilis. The microscopical examinations made by Alary always demonstrated a *large number* of Neisser's organisms.

Without denying the presence of the gonococcus in considerable quantity in cases of bartholinitis, I think that Dr. Alary is not entirely in the right, for, as we shall see in the studies of Dr. Leblanc, this author was only able to find it in one out of seven examinations. Legrain examined the pus from a case of bartholinitis complicating an acute vaginitis, and found a complex microbial association. Besides the micrococcus pyogenes aureus and albus he found the micrococcus lacteus faviformis and the diplococcus subflavus, but *there was complete absence of the gonococcus*.

Welander examined the liquid secreted by the vulvo-vaginal glands in twelve patients and found many microbes, but *never* the gonococcus. In five cases of acute bartholinitis he was not able to detect the gonococcus, although three of the women had this organism in the urethra. In two women having fistulæ following an abscess of

the vulvo-vaginal gland, and in twenty-one with a purulent secretion of the excretory duct of the gland, he always found the gonococcus, and, with one exception, all these patients had this organism in the urethra.

Steinschneider examined thirty-four cases of recent gonorrhœa and found the gonococcus only once, while in three cases of old gonorrhœa he was unable to find any.

Gerheim reports the two following interesting cases: The first was a gonorrhœa of the urethra and cervix. One month later there was a gonorrhœal infection of the excretory duct of the left vulvo-vaginal gland, the pus from which was very rich in gonococci. In another month the gland itself became red and tumefied, and extirpation was performed.

Microscopical examination showed that the epithelium was almost entirely destroyed. In the pus and glandular tissue no gonococci were to be seen, but everywhere in the pus and in the smallest follicles of the gland the *staphylococcus aureus* was to be found.

The second case was also a urethral and cervical gonorrhœal infection, with infection of the right vulvo-vaginal gland. The secretion of the excretory duct was thick and muco-purulent, and contained many gonococci. The inflammatory process ended in an abscess of the gland. The pus contained no gonococci, but many *staphylococci*, both *aureus* and *albus*, as well as some colonies of a long rod bacillus.

Leblanc, in a recent work, examined bacteriologically seven cases of bartholinitis and the pus from the urethra. He found the gonococcus in the latter, but only once in the pus coming from the diseased vulvo-vaginal gland. On the other hand, five times he found the *staphylococcus aureus* or *albus* and twice the *micrococcus lacteus favi-formis*.

Horaud found the gonococcus only twice out of one hundred and forty-six cases of folliculitis in the female.

To sum up, gentlemen, I may say that perhaps too much has been attributed to the gonococcus, but what I would insist upon is that there is a certain influence created by this organism which is not as yet fully understood, but is certainly of undoubted occurrence.

It predisposes the tissues to undergo more easily a secondary infection. Bumm and Gerheim long ago demonstrated mixed infections following a pure gonorrhœa.

The gonococcus probably increases the virulence of certain micro-organisms or diminishes the resistance of the mucous membrane. This is only an hypothesis which I trust may be sooner or later demonstrated.

A word now regarding the normal anatomy of the vulvo-vaginal gland before I speak of the pathology of bartholinitis.

The excretory lobules are lined with stratified epithelium similar to that found in the cervical canal. Its secretion is also very similar. These lobules empty into a kind of sinus lined with cuboidal epithelium, from which the small excretory ducts open. The latter are lined with cylindrical epithelium, which becomes of the pavement variety near the vaginal orifice. You consequently will see that secretory epithelium differs by these essential histological characters from those of excretion.

I shall quote the description given by Leblanc of the pathological anatomy of bartholinitis. The first was a vulvo-vaginal gland about the size of the last phalanx of the little finger. At one end was found a small cystic cavity, about the size of a pea, containing a muco-purulent liquid tinged with blood.

Microscopically was found : (1) some striped muscular fibres at the periphery of the tumor, probably part of the constrictor of the vulva ; (2) some glandular lobules, which appeared normal ; (3) very voluminous excretory ducts, whose epithelium presented abundant proliferation in certain points.

On the other hand, the epithelial cells had lost their elongated shape and had become nearly round, while in some ducts they nearly obstructed the canal by their agglomeration. Around all the ducts an embryonic infiltration was noted. In some places, especially near the medium-sized ducts, the round-cell infiltration produced masses in the midst of which no trace of normal tissue could be discovered.

Some of these agglomerations had begun to undergo disorganization, so that they formed literally *small pericanalicular abscesses*. In one point one of these abscesses had opened into a duct after having destroyed its walls.

The arteries and veins were very abundant in the midst of fibrous tissue, but presented no special lesion.

The gonococcus was carefully searched for in the tissues, but none were found. Besides the pus-globules, which were quite numerous, sticking to the epithelial walls, epithelial *débris* was found in the ducts and round points grouped in masses, which by culture proved to be staphylococci.

A second gland was also examined by Leblanc. The principal excretory duct still had its lining epithelium, which proliferated considerably into the canal as well as towards the surrounding connective tissue.

Other sections showed the glandular tissue in the midst of fibrous tissue, rich in unstriped fibres. Between the lobules of the parenchyma were seen the divisions of the principal excretory duct, their epithelium presenting a marked proliferation.

All the sections examined were filled by an embryonic infiltration. The smaller branches of the principal excretory duct were particularly undergoing this process, while the neighboring connective tissue was riddled with round-celled proliferation. The round-celled proliferation appeared to diminish as the deeper parts of the gland were reached, and parts of the parenchyma were normal, although limited on all sides by diseased ducts. No gonococci could be detected in the tissues.

Touton's researches are practically the same as to his findings, so I will not repeat them.

Klein appears to be the only one who has had the good fortune to find the gonococcus in the gland, but he states that the invasion diminished progressively as the interior of the gland was reached, and that only those parts lined with pavement epithelium—that is to say, the excretory ducts—contained the organism, and that the glandular parenchyma, made up of cylindrical epithelium, was in no way infected.

To sum up the pathology of this affection in the chronic form, it may be said that it is *always an inflammation of the excretory ducts of the gland, which diminishes in intensity as the deeper parts are reached.* The embryonic infiltration is not active in the excretory ducts, while the surrounding fibrous tissue forms small abscesses which have been demonstrated by Leblanc.

If I have dwelt at length on the pathology, it is in order that you may understand the nature and treatment of this disease, because, on account of the multiple lesions found, you can readily see how a recurrence of acute bartholinitis can occur. These small pericanalicular abscesses evolve each on their own account, and when an acute inflammation of the gland is treated by incision, rest, and antiphlogistics, they end in resolution. But, generally, after too short a treatment, some cause, such as coitus, menstruation, etc., produces a hyperæmia of the gland, the pericanalicular abscesses take on a new development, and, by a reagglomeration of their contents, form a new purulent focus.

We now come to the symptoms of this inflammatory process of the vulvo-vaginal gland, which may vary very much in intensity with each case. There are, however, three distinct periods,—viz. :

1. Period of inflammation.
2. Period of suppuration.
3. Period of cicatrization.

1. Period of inflammation. After the action of the cause, which is usually short, varying from a few hours to two or three days, the first symptoms appear, usually unnoticed. But, if you question your patient, you will find that she had, in the first place, a pruritus and sensation of heat at the vulva, usually on one side. Heat and tension may also be complained of, as well as painful micturition, and if there is a concomitant vaginitis, as in the patient I have shown you, the symptoms are still more intense.

Little by little the pain becomes localized, being principally felt at the lower end of the labium affected. However, pains may be felt shooting towards the rectum, urethra, etc., even extending into the buttock of the corresponding side.

Upon examination, the labium of the affected side will be seen considerably larger than the other. The surrounding skin is red, and occasionally traces of a lymphangitis may be seen. By palpation the part is found hot, and if you introduce your index finger into the vagina, with the thumb outside, you can catch up all the diseased tissue and pull it out into view, a thing that you should never neglect doing, as the condition of affairs will be readily explained, and at the same time you will ascertain if fluctuation is present or not.

Now, if you lift up the labium on the diseased side, you will notice that the mucous membrane covering the tumefaction is tense and red, especially near the orifice of the excretory duct.

In this stage the neighboring parts have not participated in the process to any marked degree, and the upper part of the labium is hardly, if any, deformed. The sharp, lancinating pains are not as yet present, and it is quite possible for you to abort the disease by a properly-directed antiseptic treatment if the patient consults you at this time, which is not usually the case.

2. Period of suppuration. All the symptoms that I have just described increase in intensity. The pain is continuous, walking becomes difficult and very painful, so that the patient will walk with the body bent forward, and the legs spread apart, in order to avoid friction of the parts.

Sitting is intolerable on account of the compression produced.

The size of the tumor increases considerably, and may reach the size of a walnut, or even that of an egg or pear. Remember that it projects more on its internal aspect, unless there be a bilateral infection, as in the case I presented before you at the beginning of the term.

The deformity of the labium is always more pronounced in the lower third, hiding that part of the labium on the healthy side. The

vaginal orifice is more or less obstructed, and the utero-vaginal excretions are occasionally retained on this account.

By palpation you will find that the two upper thirds of the labium are normal, while a clearly limited tumor occupies the lower third. Hard and resistant during the first few days, this tumor softens little by little, and fluctuation is first felt on the vaginal side. It is on this side that the tension, pain, tumefaction, and redness are the most accentuated, and when the abscess bursts spontaneously, it is around the orifice of the excretory duct, and not above the myrtiform caruncles, on the external aspect of the labium majorum, nor on its free border, that this takes place.

During the acute stage general symptoms may occur, although not of any great gravity. These are chills, fever (especially towards evening), gastric troubles, and constipation.

3. Period of cicatrization. When the abscess opens spontaneously, it is due to some movement on the part of the patient, and after this has occurred, great relief is felt.

The pain disappears and the patient can sit, urinate, and go to stool without discomfort.

A more or less considerable quantity of pus flows from the abscess. It is thick, homogeneous, yellow or brown, and nearly always contains some blood. If the pus is fetid, you should examine carefully to see that you are not in the presence of a perianal abscess, because the symptoms of the latter affection might cause you to think, if no digital examination had been made, that you were dealing with a bartholinitis.

The evacuation of pus is rapidly accomplished because the abscess pocket is always quite limited in extent, and cicatrization is completed in four or five days, without loss of substance to the labium.

But, when the purulent focus discharges by the excretory duct, the evacuation is less easily accomplished and less complete. Cicatrization of the focus is delayed because the presence of pus produces a chronic inflammation which may last for many weeks. The gland always remains inflamed and in a state of hyperæmia for some time, and induration is present for a long period, no matter in which way the pus may be evacuated.

If patients will remain quiet in bed and avoid all genital excitation during convalescence, a cure will be accomplished, but by coitus or menstruation a congestion is set up that will be the cause of these recurring bartholinites, so frequently met with in practice.

As you have seen by the remarks that I have made regarding the symptoms, it is evident that the duration and the progress of abscess

of the vulvo-vaginal gland are extremely variable. Generally it is all over at the end of about twenty days, but, as I have already pointed out, the cure is hardly attained when the patients expose themselves to causes which reproduce the disease with all its acute symptoms. Guérin has pointed out the relapsing form of these abscesses and their great facility of recurrence under the influence of the slightest cause.

At other times the inflammatory process passes over to the other side of the vulva, and thus produces an *alternating bartholinitis*.

Lastly, in cases of slowly-developing abscess, the gland remains indurated for a long time, and the symptoms appear to be getting better, but still suppuration finally occurs. The consecutive cicatrices of this disease end by completely disappearing, and the last trace of its former presence is a small induration, of which I have already spoken to you. When the abscess opens near the myrtiform caruncles it often results in a cicatrice, presenting a depressed shape, so that it might be mistaken for the remains of a former chancre. Fournier says that when this abscess opens spontaneously it leaves behind sometimes a real destruction of tissue, with the borders sharply cut and undermined, measuring in surface about the size of a quarter of a dollar, and this ulceration, coming from a gangrenous destruction, is so like a simple chancre that a mistake could be made. These cases, although rare, should nevertheless be mentioned in order that you may be on your guard in making the diagnosis.

As to the resolution of a bartholinitis, it is of such rare occurrence that hardly a case has been reported. It is not the same for gangrene. Velpeau says that he has several times seen the free and thin edge of the focus become mortified and eliminated in strips. These cases must nowadays certainly be rare since the antiseptic method has been employed.

You consequently can, gentlemen, in most cases make a good prognosis, but you must remember that it will vary very much, according to the cause, the progress, and the complications which may possibly occur. Let me mention in particular the extensions of the inflammatory process to the inguinal glands, to the surrounding cellular tissue, and resulting in a phlegmonous abscess, an abscess of the excretory duct ending in a chronic inflammation of the vulvo-vaginal gland, etc.

When neglected the pus may undermine and cause considerable destruction of the tissues with an ulceration which is difficult to heal, and may result in recto- or vulvo-vaginal or urethral fistulæ.

The relapsing abscess already referred to may be compared to the

disease designated by Ricord as "*tilting orchitis*," and in this case the prognosis should be reserved.

To summarize, I may say that this disease, without being serious, may produce considerable inconvenience, and, in spite of the most absolute continence, there are patients who see this affection recur so frequently that they consider it a real infliction. Consequently you must not neglect the treatment, but take it in hand early, and make the patient understand the importance of submitting their disease to proper therapeutics. But before speaking of the treatment I wish to say a few words regarding the diagnosis.

When the abscess is formed the diagnosis offers few difficulties, and it is only necessary to consider the symptoms that I have already mentioned. The abscess develops first in the excretory duct, and should be distinguished from inflammation of the gland itself. In the latter case the tumor is situated more deeply and farther away from the vaginal orifice, and is a little lower in the labium majorum, while fluctuation manifests itself more tardily, and is especially to be found on the internal aspect. The size of the tumor is considerably greater, and it deforms the vulva to a greater extent, while spontaneous bursting is longer in occurring. The pus, which comes away rarely from the orifice of the excretory duct, has not the same characteristics ; it is more creamy and thicker. The parenchymatous abscess is more painful, and may even be accompanied by symptoms of general reaction which are not seen in cases of abscess of the duct alone.

Phlegmon of the labia majora or of the vulva will never be taken for a bartholinitis. Their symptoms are more severe, and their situation, extension, and general symptoms which accompany them are very much graver, while the formation of fistulæ will do away with any error on your part.

Stercoro-vulvar abscess should not be mistaken for a purulent collection or inflammation of the vulvo-vaginal gland. A stercoral abscess is ill-defined, while the glands have a shape which is difficult to mistake. In the first case the pus may be pushed back by pressure with the finger ; there is a limited incompressible tumor if it is the gland. In the one the pus has the fetid smell of purulent collections formed around the intestine, while it is almost always odorless when it comes from a bartholinitis. In case of doubt, a rectal examination should never be neglected, as well as the passage of a sound into the wound. If it is a stercoral abscess, the finger in the rectum will meet the point of the probe, from which it is only separated by the thin tissues of the rectal wall.

Serous cysts, which quite often develop in the excretory duct, are easily recognized. They are indolent, while an abscess is always painful, and accompanied by inflammatory reaction. Cysts never produce heat or redness of the mucous membrane of the vulva. The sensation that is felt by palpation differs from the fluctuation that is found in abscesses. In the cyst, the fingers will be able to detect a more watery liquid than in an abscess, because in the latter there is a special pasty feel, which is characteristic.

Pathological lesions of the bony pelvis may produce an abscess that might be taken for a bartholinitis. The pus in cases of disease of the bone is serous and very abundant; in abscesses it is creamy, and its quantity is limited. The pus of a bartholinitis is ordinarily contained between the two aponeurotic layers of the perineal floor, while that due to an abscess of the bone covers a more considerable area.

Thrombus of the vulva is to be distinguished from bartholinitis by the involvement of the entire labium as well as by the color of the tissues, which are the seat of an intense infiltration.

Inflammation of the sebaceous follicles of the labium majorum, or furuncles, which are frequent in this region, develop in the glands of the skin and underlying cellular tissue, while an abscess of the vulvo-vaginal gland cannot be outlined by palpation.

Certain abscesses form occasionally on the course of the lymphatics, which from the vulva empty into the glands of the groin, but their superficial seat and their shape distinguish them from the disease that we are considering.

We now come to the treatment of bartholinitis. Thanks to the antiseptic method, the treatment of the inflammatory diseases of Bartholini's glands is now very simple. Older practitioners prescribed poultices or resolutive ointments as well as emollient lotions. This practice has been put aside, and rest in bed, with baths and injections, is all that we have retained from former practice.

During the acute stage you will simply apply a damp dressing, dipped in an antiseptic solution such as a three-per-cent. boracic acid or two-per-cent. carbolic acid solution. Sublimate I consider far too irritating even when a very mild solution is employed, and consequently would advise you not to employ it.

The compress is covered with a piece of rubber tissue in order to prevent an evaporation, and the whole is held in place by a T-bandage. This treatment, when it is employed at the very beginning of the disease, will perhaps abort the inflammatory process and bring about a rapid cure by resolution.

When fluctuation is present you must not hesitate to immediately incise the abscess. Some surgeons think that an early incision should be avoided because it is dangerous. I think that this is erroneous, and that an early opening is far the better plan, even if it only diminishes the congestion.

As to the place of making the incision, it has been greatly discussed. Although I would not make any fixed rule for this, I think that it is better to open the abscess at its greatest projection and where fluctuation of the tumor is most distinct, because if left alone the abscess will certainly open there of itself. As to drainage, it certainly presents the necessary conditions for a good cicatrization, and I think prevents fistulæ as well as relapse. On the one hand, it prevents the occlusion of the opening because it fills it all, and, on the other hand, it allows of the progressive evacuation of the pus through the tube.

The damp dressings, of which I have already spoken, should cover the drainage-tube. They should be changed every day, the drain cleaned, and an antiseptic irrigation of the abscess cavity should be practised.

The drain should be removed when the cavity has notably diminished, or when the granulations have pushed out the tube.

For draining purposes, instead of the tube it may perhaps be better to use iodoform gauze packing, which you will introduce into all the recesses of the abscess cavity with a probe.

Some surgeons advise swabbing the abscess cavity with chloride of zinc or nitrate of silver, but this appears to me useless, because these agents modify only very little the pyogenic membrane.

Whatever method you may adopt, an incision, combined with antiseptics, will very rapidly bring about a cure in simple abscess of the vulvo-vaginal gland.

As to relapsing abscesses, we have seen what their pathology is, and to-day extirpation of the gland is decidedly indicated in these cases. I usually put the patient under complete narcosis and perform this simple operation, although it may be done with a local anaesthesia with cocaine. The patient is placed on an operating table with the buttock well over the edge, the legs flexed upon the abdomen and spread apart. The vulva is shaven and an antiseptic toilet of the parts is practised.

The labia majora and minora are separated by an assistant, and a longitudinal incision or two semi-elliptical ones are made. The straight incision should be made in the lower part of the nympho-labial fold; the semi-elliptical ones are made at the base of the enlarged gland.

beginning with the lower external one. The tumor is then seized with a tooth-forceps and carefully dissected out with the knife, or, better still, with a pair of curved scissors. Remember that the *base of the gland should be liberated and detached.*

The bulb of the vagina should be respected as much as possible in the dissection. It is, as you are aware, situated in front of and above the gland.

Should the transverse artery of the perineum be cut it can easily be caught up and ligated. Slight hemorrhage from the venous plexus of the vagina may occur, but can generally be controlled by a gauze tamponnade.

In closing, let me say that pregnancy, instead of being a contraindication, is decidedly an indication for performing this operation, because, if this suppurating focus is present, the labor is in danger of complications of a most serious character, such as septicæmia and other septic troubles.

Ophthalmology.

PTERYGIUM; PHLYCTENULAR OPHTHALMIA.

CLINICAL LECTURE DELIVERED AT THE HOSPITAL COLLEGE OF MEDICINE.

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GENTLEMEN,—I ask your attention to this patient, a male, aged fifty years. You will observe that he is a laborer from the country. By looking at his left eye you will see plainly that there is a reddish fold of the conjunctiva that spreads out from the inner side of the white portion of the eye extending over the corneal margin. This condition is called pterygium. A fold of the conjunctiva is carried over on to the cornea. Though more usual after middle life, yet it occasionally occurs in the young. It is most frequent in persons who are exposed to dust and other irritating substances. You will see that the pterygium is quite reddish in color, and appears as a thickened mass as it extends over from the inner corner of the eye towards the centre, from the sclera on the cornea.

A word or two about the cause of pterygium. I am going to show you in a few minutes that I can pass a probe just at the sclero-corneal junction immediately beneath this little growth. You will see by that means that the growth is actually a folding over. It takes place usually from a slight thickening of the conjunctiva, which occurs at the sclero-corneal junction and usually at its inner side; a foreign body, perhaps a small particle of dust, lodges there and a little ulcer forms, then in the cicatricial contraction that results, the conjunctiva is pulled over, finally reaching the cornea. That is the most plausible explanation of the cause. You must remember that pterygium is a growth of the conjunctiva and not of the cornea; that it is much more frequent on the inner side than the outer; that a true pterygium never occurs from above or below, but always at one side or the other, most frequently, as I said, from the inner. It produces symptoms of three

kinds: one group may be mentioned as irritation of the eye. It keeps up a hypersensitive condition of the conjunctiva with frequent attacks of conjunctival inflammation. Another is that it lessens the proper mobility of the eye, because the fold of conjunctiva is stretched tightly from the inner corner of the eye to the cornea. The third group of symptoms is interference with vision. This interference of vision is due to two causes: one is that the pterygium, as in the case before us, extends so far over the cornea as to encroach upon the pupillary space. It therefore makes an opaque spot over the pupil and greatly interferes with the sight of the affected eye in that way. Again, by its contraction it distorts the cornea, producing astigmatism, which in some cases may be corrected by the adjustment of proper glasses, but of course the cause still persists. Again, the cosmetic effect is a feature that must be considered in these cases. This, of course, can only be improved by an operation. It is true that this matter of personal appearance is not usually so important in pterygium patients as it would be in many others, because they occur mostly in the laboring classes and in persons past the middle age. All these conditions you will see apply to the case before us. Medical treatment is useless so far as removal of the pterygium is concerned; it will accomplish nothing. Of course, it will go far towards controlling attacks of inflammation that occur from time to time in the conjunctiva that is the subject of this growth, but it will do nothing towards removing the pterygium itself. Then you will ask, Should every case of pterygium be operated upon? We may say with a fair degree of accuracy that every pterygium does not need to be operated upon: it depends upon whether it is still growing or not, and it depends very largely upon its situation. A pterygium that has extended over upon the cornea, and especially one that has a very red color, and one that is still in active growth, ought to be removed by operative interference. On the other hand, a pterygium that barely touches the corneal margin, the color being pale, the irritation being slight, showing that it has reached its retrogressive stage, and is no longer advancing, may be safely left alone.

Our patient's case evidently requires operation. It requires it, because, as you see, the color of the pterygium is a dense red; it requires operation also because the growth already extends over the cornea to the papillary area; it is a very active growing pterygium, and an operation is called for. This man, I take it, cares very little for his personal appearance, and comes to us for operation simply that he may see better afterwards.

Now as to the question of removal of this growth. The best

operation is to dissect up from the cornea the part which is attached to it, and then with two snips of the scissors cut off the pterygium at its base, leaving a lozenge-shaped space of which the scleral portion is to be closed by bringing together the conjunctiva with sutures. There are other methods of operating upon pterygium, ligation, etc., but I will deal solely with the method of excision. Let me caution you not to expect too much from your operation. You will improve your patient's sight where the pupillary space has been encroached upon ; you will remove that condition of irritation of the conjunctival tissue caused by the growth ; you will add considerably to the appearance of the patient also, but notwithstanding these improvements, gentlemen, a little opacity of the cornea will remain, because at the point where this growth has been attached the corneal epithelium will have been destroyed, so that while sight will be improved, it will still be somewhat impaired.

We will thoroughly cleanse the lids and the conjunctival surface with a weak solution of the bichloride of mercury, and place in the eye a drop or two of a ten-per-cent. solution of cocaine at intervals of three or four minutes, and then proceed with the operation. The instruments required are first a speculum to open the eye ; second, fixation forceps. I am going to use the fixation forceps for a twofold purpose in this case, to steady the eye and also to grasp the pterygium ; then taking the small knife which I show you I will dissect the growth from its corneal attachment. It is not necessary really to make the dissection as I have outlined, as firm traction upon the pterygium will pull it loose from its attachment to the cornea. But it is a little neater to dissect it back with the knife. Then, of course, I must have a small pair of scissors to cut the growth off at its base. Finally, I must have some threaded needles and a needle-holder to draw together the conjunctiva on either side and cover the raw surface. I will cleanse my hands carefully because cleanliness is of the utmost importance in all operations about the eye, and of far greater importance than the use of chemical antiseptics. Cocaine has been introduced several times at intervals of three or four minutes, and anæsthesia is probably now complete. We have used in this case a ten-per-cent. solution of cocaine, which I think is better than four per cent. for operations about the eye. Only this morning I was doing an operation for secondary cataract, and trusted to a four-per-cent. solution of cocaine anæsthesia, and the lady complained of considerable pain, so much so that I did not quite complete my operation. I believe in such cases it is wiser to use a ten-per-cent. solution.

The best eye speculum that I know of is quite an old one, the speculum of Graefe. It has the disadvantage that it is necessary to have one for each eye, but, notwithstanding this, I believe it is the best speculum we have. You observe that I catch up the growth with forceps, and will now demonstrate what I have previously said, that a probe can be slipped under the growth at the sclero-corneal junction. Having removed the pterygium first by dissecting it off the cornea, then by two snips of the scissors directed towards the inner angle of the eye, I will now undermine the conjunctiva on either side so as to draw it together with my stitches, and you will see that it will cover the raw surface perfectly. A very good operation for the relief of this condition is to dissect back the pterygium from the cornea, and turn the end of it under the conjunctiva, putting in one stitch near the sclero-corneal junction to hold it there. We are rather more likely, however, to have a return by that method than by the method of complete excision. It is necessary to be very careful in bringing the conjunctival edges closely together at the sclero-corneal junction, else you will have a return of the trouble. I have introduced my sutures which you will see bring the wound entirely together. In a broad growth of this kind it is usually necessary to put in about three stitches. If too few are used we might have a large scar and probably granulation tissue would form on the sclerotic surface. Some one asks me the question whether, when the operation is completed, the conjunctiva will be as smooth as on the other side. Ultimately it will, the only remains of the growth will be a slight opacity of the cornea. The stitches may be removed usually in three or four days. The after-treatment of these cases consists in the application first of some absorbent cotton covered with carbolized vaseline, and over that a smooth fitting bandage. The bandage and cotton should be removed after twenty-four hours, the eye carefully washed, then the bandage replaced and left for a day or two. At the end of a week I hope to present this man before you with a perfect result.

CASE II.—In the next patient you see a representative of a class of cases often neglected. This little girl is seven years old. You will observe at a casual glance that she is a child with a thick skin and heavy upper lip, and with a slight tendency to eczema about the eyelid. You will observe, in the next place, that she keeps the right eye closed, showing that it is very sensitive to light. When we open the eye we find there is decided ciliary injection,—that is, redness of the ball just around the sclero-junction. This is also known as ciliary redness or circumcorneal injection. We find there is a spot of opacity

near the centre of the cornea, and two or three other spots scattered over the cornea. We observe, finally, that the pupil is very small and the iris is discolored. From these corneal spots, then, we make the diagnosis of phlyctenular keratitis, and from the discolored iris and the contracted pupil we find it to be associated with iritis. The old name for phlyctenular inflammations of the eye is strumous or scrofulous ophthalmia. The name is somewhat vague in its actual significance, yet it is very suggestive both as to the cause and treatment of these cases. We find them, as a rule, in children who are improperly fed, and who live in unwholesome surroundings. But the disease is not confined to persons in the lower walks of life, for errors of diet and hygiene are common among the rich also. We are very apt to find associated with this form of disease of the eye enlarged glands of the neck that we at once think of as being strumous; we frequently find a peculiar condition of the teeth, not the Hutchinson teeth that are characteristic of inherited syphilis, but teeth that are characteristic of rickety tendencies, teeth that Horner, the celebrated Swiss oculist, called especial attention to. I want you to observe how sensitive this little girl's eye is to light; see how she protects her eye with her hand. That intense photophobia in the child is almost pathognomonic of phlyctenular ophthalmia. You will often be called to see a little patient suffering with an inflamed eye, as it is commonly called, and you will find the child burying its face in the pillow; you will find them too often shut up in a darkened room; you will find them doing what this little girl is doing now, holding her hand over her eye to exclude the light, and in the majority of these cases you will find phlyctenules on the cornea. Intense sensitiveness to light is a characteristic of this disease. Upon examination I find a slight involvement of the cervical glands, as I told you we generally find. I do not, however, find the terraced teeth that are occasionally seen. These children very often have enlarged faucial and pharyngeal tonsils, and the removal of these conditions is very important in preventing a tendency to return. I want to remind you that one of the annoying features of this form of inflammation is its tendency to frequent recurrence. This little patient has been suffering from the trouble, so the attendant tells us, for two or three years; she says it gets well and then gets worse again. We find she has a rather deep-seated enlargement of one tonsil, but it is not very marked.

You will notice, gentlemen, that we have asked no questions as to the symptoms in this case; it is not necessary. Here is a disease in which the objective symptoms and the child's appearance tell us the

whole story. It is needless to ask whether she has had pain, whether the eye is sensitive to light, whether there is blurred vision, whether the eye is watery, etc. : all these conditions we know have taken place. We know that the chief one of them all is intense sensitiveness to light, next to that I would say comes blurred vision. She has blurred vision because a part of the phlyctenular mass is just over the pupil. We also notice that abundant lachrymation is occurring. Phlyctenular ophthalmia sometimes affects the conjunctiva, sometimes the cornea, and sometimes both together. In the little patient before us it has involved the cornea only. The formation consists of elevations of the corneal epithelium, somewhat roundish in shape, due to a collection of leucocytes just beneath them. They finally break and leave minute ulcers which in time heal. They leave no opacity if very superficial, but too often a slight scar marks the spot of their former site. A point of importance is whether this occurs just over the pupil or at its margin. If it is over the pupil, the vision of the patient will always be somewhat impaired. They will see as if through ground glass, whereas if on the margin of the cornea it is a matter of little importance. As regards some of the other courses the disease may take, I can only remind you briefly of a few. Occasionally it goes on to perforation of the cornea and prolapse of the iris. Rarely a deep sloughing ulcer may form, and a large part of the cornea be destroyed. Finally, quite frequently we find a leash of blood-vessels running towards the little ulcer on the corneal surface, and we then call the condition phlyctenular pannus.

The treatment is both constitutional and local, and they are equally important. Of constitutional measures, both the hygienic and medicinal are to be remembered. Hygienic treatment means simple food, pure milk, fresh meat, fruits, etc. ; no sugar, no sweets, candies, pastries, etc. It means plenty of out-door air and exercise. Unfortunately, the tendency on the part of parents is to shut these little sufferers up in a darkened room. Their sympathy yields on account of the patients' extreme sensitiveness to light. What they ought to do is to keep the children out of doors in the light, and especially see that they get pure air, the eyes being protected by dark smoked glasses, or a shade, or an old-fashioned sun-bonnet. The more they are out the better. Keep them clean, give them a salt bath every morning, or better every night before they go to bed, rubbing them well with a moderately rough towel afterwards. As to medicinal constitutional treatment: Vague as our conception of the exact pathology of the strumous or scrofulous condition may be, we usually associate with it cod-liver oil and

iron, and these are the two agents that are most valuable in the treatment of this disease. In the case of a small child I usually give cod-liver oil and the syrup of the iodide of iron.

In regard to local treatment: First examine the throat, and if the tonsils are enlarged excise them. Put your finger up behind the nose and feel for adenoid growths; if present remove them. If there exists, as is frequently the case, an eczema at the margin of the nose, touch it with a strong solution of the nitrate of silver, and give them some of the yellow oxide of mercury salve in the proportion of one grain to the drachm to be used on the inflamed spots.

Local treatment of the eye: In the acute condition you should use atropine. It dilates the pupil it is true, and yet usually it lessens the sensitiveness to light. This at first sight seems to be a contradiction, but atropine is sedative to an inflamed eye. It puts the eye at rest, and this tends to allay the irritation. Put into the eye two drops of the solution of two grains to the ounce of sulphate of atropine two or three times a day. In addition to that you will use the yellow oxide of mercury salve in the proportion of one grain to the drachm of vaseline. Have the nurse or mother hold the child in her lap on its back, put the child's head between your knees face upward, then open the eye and carry in the salve on a clean probe. In cases where there is no inflammation of the iris, where the phlyctenules are very minute and located just at the margin of the cornea, more or less surrounding it like a ring,—that is, in the condition known as miliary phlyctenules,—you will find the most beneficial solution to be one of sulphate of eserine, one grain to the ounce of distilled water, dropped into the eye, instead of the solution of atropine.

OPERATIONS FOR CATARACT.

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GENTLEMEN,—This evening I propose to discuss the question of operations upon complicated and uncomplicated forms of cataract. It is not to be supposed that you will be prepared to do such operations successfully unless you are physicians, and have some knowledge of eye-diseases, and are able, after the recovery of the patient, to test the refraction and prescribe glasses. A lack of this knowledge will exclude the general surgeon from properly undertaking such an operation, though he may understand the necessary technique. I would not advise you to essay your first cataract operation until you have had considerable practice in extracting the lenses of animal eyes, of which pigs' are the best. I would not venture to give you here, in a practical school, a didactic lecture upon cataract operations, unless I could relate frankly and honestly some of my own personal experience. To simply state what you may better read in a text-book would be of no value. While I emphasize my own opinions, I do not express them dogmatically, or ignore opposite views.

The present status of cataract extraction is a growth, and was not born full-fledged, like Minerva, from the brain of Jupiter. It has reached its present stature through much selection and survival of the fittest. In the mediæval ages cataract prickers went about from place to place, couching or depressing the lens, and, even in India, at the present time, they operate with a long sharp thorn. The lens after such an operation sometimes appeared in the anterior chamber, and Dr. Jacob Daviel, of Marseilles, was in the habit of removing it from the eye by an incision in the cornea. Subsequently, he was the first, it is said, to venture to remove (in 1745) the cataract from its natural position through a corneal incision. Since that time very many modifications have occurred as to the position of the incision, etc., and as to the

form of the knife used. It may be interesting to go into a few particulars in order that you may understand the superiority of the present operation. But we will first indicate some of the more usual forms of cataract and their treatment.

Cataract is chiefly soft or hard, in a practical sense, according to the consistency of the nucleus. The periphery is soft in old age or youth. Noyes says that discussion of soft cataract is almost limited to the age of fifteen, while it may be done on patients up to the age of twenty-five. For my own part, I have so strong a preference for discussion whenever it is practicable, as compared with extraction, that I not only would not hesitate to do it up to the age of forty, but would much prefer it. And I am encouraged to do it, not so much from experience with soft cataracts of idiopathic form which are usually congenital, but from experience with the traumatic form; for the latter in a patient under forty frequently undergoes absorption without any interference whatever. I have operated by discussion on cases of congenital cataract at the age of thirty-five with the usual satisfactory result in regard to vision. Soft cataract is generally congenital. Hard cataract appears usually after the age of fifty, and is called senile. Although a soft cataract *may be* removed through an incision in the cornea, discussion is safer. A hard cataract in a patient over fifty years of age cannot be removed by absorption after any reasonable amount of discussion. The youngest age at which to operate upon soft cataract is still an open question. In congenital cataract the eye does not functionate well. Hence its development is arrested. On this ground it is best to operate as early as three months of age, unless there is any reason in the general health for delay. If a patient with congenital cataract should not consult you until the age of twenty, you had better do a preliminary iridectomy before the discussion, so that when the lens swells it will not press upon the iris and produce an iritis. In recommending to you any method of operation, my advise is based solely upon a consideration of safety, and neither time nor cosmetic effect should make you lose sight of this goal. If, however, you have had a large experience, you will be tempted to wander into the more difficult methods. In discussion, enter the needle through the external inferior quadrant of the cornea midway between the centre and the periphery, thrust it to the centre of the capsule, and make a slight incision. Then make an incision at right angles to the first, and break up the lens over a small area and very superficially. It is very important that in the first operation you do very little, otherwise the lens would swell too much and produce injurious pressure and tension. The object is to allow the

aqueous to come in contact with the lens, to macerate it, and cause re-sorption. If, after needling, the tension should become too great, and could not be relieved by the use of atropine and hot applications, the anterior chamber should be tapped to let out aqueous and lens matter. The eye would bear much better an incision than it would tolerate the intraocular tension. When should the needling be repeated? Some give specific directions as to time. My own rule would be: pay no attention to the time limit. Operate so soon as the lens ceases to swell and be absorbed, and the eye is free from irritation. I have made a second needling in some cases three days after the first, and in others in three months. The second needling may be done much more freely because the size of the lens has been very much reduced. Two needles may be used, one to fix the lens, the other to break it up quite freely if absorption has much reduced its size; or to bore a hole right through the centre; but if only a little absorption has taken place, be very careful in the amount of the discussion. When the lens is absorbed, capsule may be left that will require further operation. Never use the shaft of a Bowman needle to rupture a pupillary membrane. If it is thin, cut it with a knife-needle. If the membrane is tough, and especially if it adheres to the ciliary processes or to the iris, it involves more risk to rupture the membrane than to do a discussion of the lens. In fact, eyes are more frequently lost from interference with the pupillary membrane than from needling or extraction of the cataract. The performance of extraction of cataract gives me less anxiety than an operation upon a tough pupillary membrane. The safest possible way to get an opening through the latter is to introduce the capsule scissors, or short-bladed DeWecker's iridotomy scissors, through a corneal incision, and, after puncturing, incise the membrane, and, if necessary, make a second cut at an angle to the first. I cannot recommend the suction operation for soft cataracts, which I have seen only at Moorfields, nor the linear extraction, unless, when the capsule is needled, the lens is found to be perfectly fluid. Then a short cut through the cornea may be made to allow the lens to flow out. Neither in Europe nor America have I seen a Graefe operation (linear) performed in the last twenty years.

We now come to a brief consideration of hard or senile cataract. The patient must have light perception, or it would be useless to remove the cataract. A patient with a fully matured cataract should see a candle-flame two to six metres in a dark room. A limited field of vision indicates fundus disease. Fingers should not be seen at a foot, generally speaking. On the other hand, there are operable lenses that

are matured as to extent of cataract, but with sufficient translucency to admit of counting fingers at a foot. Daviel incised two-thirds of the lower margin of the cornea, ruptured the capsule, and extracted the lens without an iridectomy. Beer made a triangular knife which completed the section with one cut. He did not at first do an iridectomy, but subsequently introduced it into the operation. Later, Von Graefe—about thirty years ago—made his modified linear incision, and invented a knife which is the one generally used.

We come now to the operation which is most generally performed. The incision which is practised by the majority of operators to-day is at the upper third of the margin of the cornea.

The next procedure is in dispute. That is the question,—an iridectomy or no iridectomy? I think that most operators do an iridectomy, while many of very large experience do the simple operation. I urge you not to adopt the latter method, and I think I can give you several good reasons why you should not. I do not deny the success of the operation in the hands of expert operators with large experience, yet what is their own testimony? Six to twelve per cent. of the irises prolapse into the wound. Noyes says, "The simple operation is less complicated, the indirect vision is better, and the eye looks more natural,—that is, it has a circular pupil." That is what is claimed for the simple operation. On the other hand, Schweigger says that "iridectomy may in certain cases prevent complications which would lead to inflammation." And another author says that it was proposed to facilitate expulsion of the lens and diminish the liability to prolapse by iridectomy. Schmidt-Rimpler says that iridectomy counteracts secondary iritis.

What are the disadvantages of the simple operation? Simple is a misnomer. As to the technique of the whole operation, it is not simple, but complicated. The pupil being smaller more pressure upon the eye is required to extract the cataract and the cortical matter that remains. Another serious objection is prolapse of the iris through the wound, not only at the time of the operation, but at any time within a week. Prolapse of the iris interferes with healing, renders the eye liable to infection and inflammation, and a secondary glaucoma at any time thereafter.

A Russian of large operative experience, when asked if he does the simple operation, said, "Yes, in hospital practice, but in my private practice I do an iridectomy." You may draw your own inference.

Next, the rupturing of the capsule. It may be ruptured by almost any incision you prefer, perhaps best by a horizontal one across the

centre of the lens. Gayet (Lyons) and Knapp make a peripheral incision. Ninety per cent. of the patients so operated upon require a secondary needling.

Next, the delivery of the lens. Before this stage I think the speculum had better be removed to avoid dangerous pressure. Press the upper lip of the wound with the superior lid, and press the edge of the inferior lid backward and upward against the cornea until the greatest diameter of the lens presents in the wound, then lessen the pressure.

After the nucleus escapes, leave the eye for two or three minutes till the aqueous resecretes, so as to assist in delivering the cortex. With the upper lid held open, apply massage through the lower lid to force the cortical matter up into the wound and out. Then use oblique light to see if the pupil is clear. If the patient can count fingers at two or three feet the result is satisfactory.

McKeown introduced the plan of washing out the chamber. A one-half-per-cent. salt solution, or biniodide of mercury one to twenty thousand is used with various forms of syringes. I have used it once only. If the remains of the cortical masses cannot be delivered by massage of the cornea, it is not safe generally to use irrigation, for the vitreous as well as the remains of the cortex may be pressed out. Press any iris that may be in the wound back into the chamber. Also with capsule forceps search the wound and remove any capsule that may be found.

I will leave the subject of after-treatment to Dr. Wood. I prefer to apply silk plaster over both eyes, and a wire protector. Silk plaster is transparent, and admits of an examination of the eye without removal of the dressing. Open the eye first forty-eight hours after operation and drop in atropine and an antiseptic wash.

In regard to preliminary iridectomy, it may be done from two to four weeks before the extraction. I have given you what I think are valid reasons for doing an iridectomy. If you admit that iridectomy is advisable, then I think there is good ground for preferring a preliminary iridectomy. To that end I wish to be fortified in my opinion and practice with a few remarks from others.

Von Graefe thinks that in unfavorable cases, or if an operation on one eye should terminate in suppuration, it is desirable to perform a preliminary iridectomy on the fellow-eye.

In 1862, Mooren recommended it for all cases, to be followed by flap incision.

Schmidt-Rimpler says, " Apart from the inconvenience of two operations and confinement to bed, a preliminary iridectomy can be

recommended if we wish to act with the greatest possible certainty." The inconvenience of iridectomy is almost *nil* under cocaine anæsthesia, and I would not hesitate to operate on a patient in an out-clinic and send him home.

Wolfe resorts to iridectomy two or three weeks previous to extraction.

De Schweinitz performs a preliminary iridectomy and extraction several weeks later, believing that this lessens the danger of extraction and is to be recommended in any case where serious results are apprehended, and if, for any reason, extraction in one eye has terminated unfavorably. Rosebrugh, Beard, Bronner, Eversbusch, Steffan, Keyser, Barraguer, Dor, Landolt, and others practise and advise it. Bowman, Wells, and Critchett have considered it the safest operation for cataract. My colleagues, who do not regularly practise a preliminary iridectomy, do it if they have lost one eye, or if they have a complicated case to deal with. For my part, I invariably do it. Incision of the cornea and removing the cataract is not painful under cocaine. Hemorrhage during the combined operation obscures the subsequent removal of the lens; whereas the hemorrhage of a preliminary iridectomy is absorbed within forty-eight hours, and when you come to extraction everything is perfectly clear in the operative field. Again, preliminary iridectomy divides the amount of trauma between the two operations.

Further, let the patient take a bath a day before operation; scrub the head well with soap and hot water and take a saline purgative. Next thoroughly scrub the eyelids and edges of the lashes with soap and water. Give half an hour before operation one-half drachm of chloral with one-half drachm bromide of sodium. Boil the instruments, and wipe the sharp instruments thoroughly with alcohol. Dry them, and then put them in five per cent. of formalin, wash and dry. Wash the eye thoroughly with one to four thousand of formalin, put in cocaine, not stronger than four per cent., three times within six minutes; use the speculum and rubber-tip fixation forceps, fix the eye below the inferior margin of the cornea firmly. Use a Graefe knife after testing it on a goat-skin stretched over a drum, and be satisfied with the edge only when the weight of the knife carries it through the membrane. Make an incision in the upper third of the sclero-corneal margin, operating with whichever is the better hand. I would make a large preliminary iridectomy with a lance-shaped knife, making a four millimetre incision within a line and a half of the upper margin of the cornea. If the capsule is thin, I would rupture it with a cystitome;

but if thick, as in a recent case (a man eighty-five years of age), I would use capsule forceps to extract the capsule before removing the lens. This is much safer than to extract it after the lens is removed, because the capsule would then lie on the vitreous.

My esteemed associate, Dr. Bettman, deserves mention as the first to mature an immature cataract by direct trituration of the lens, in 1887, which he did after making an iridectomy. In case of a nearly mature cataract I do a preliminary iridectomy, and within one to three months the patient usually returns for extraction. This preliminary iridectomy, admittedly, often hastens the ripening of the cataract.

Laryngology, Pharyngology, Rhinology, and Otology.

THE RELATIONS OF THE THROAT, NOSE, AND MIDDLE EAR IN DISEASE.

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THE subject as suggested by the title of these pages is so large that I can only hope in the space at my disposal to glance at the matter in some of its bearings, and in doing so shall endeavor to choose those which are of most importance to patient and practitioner.

The term throat deafness had been before the public—both lay and medical—for many years, and if the former have no knowledge of nose-deafness it certainly has not been the fault of the medical press. It has become customary to ascribe to affections of the throat and nose a very large proportion of cases having the following clinical features,—viz., 1, deafness; 2, usually tinnitus; 3, imperforate membrane in which no evidence of cicatrization is found; 4, increased bone conduction. I shall not under this last heading enter into the question of high and low tones, for the matter may be said to be still *sub judice* among aurists, and therefore not suitable for introduction into what I may term general—as opposed to special—medical literature.

These four salient features then characterize a form of middle-ear disease which has often been spoken of as chronic middle-ear catarrh, and which has been divided by many writers into the following subdivisions,—viz., (a) Eustachian obstruction; (b) chronic middle-ear catarrh; (c) proliferous catarrh; with the synonyms sclerosis of the middle ear, otitis media hypertrophica, and dry catarrh. There is a form of middle-ear deafness,—viz., serous catarrh, which should perhaps be mentioned here, but inasmuch as it is usually subacute, although commonly painless, I have omitted it in the above classification. Let us now study the others somewhat more in detail, and consider in what relation they commonly stand to affections of the nose and throat.

EUSTACHIAN OBSTRUCTION.

I must here begin by stating that pure uncomplicated Eustachian obstruction is a very rare affection excepting when due to the presence of adenoid vegetations in the naso-pharynx. Space does not permit me to dwell long upon details, but such pronounced features as (1) the markedly indrawn membrane with prominent folds; (2) the exacerbations of deafness associated with colds in the head; (3) the almost complete restoration of hearing, or the marked improvement following inflation, must be noted. We occasionally meet with this association of symptoms in cases of serous catarrh, but in such instances the yellow serum will usually communicate its color to the membrane, and other signs, such as a moist sound on auscultation during the passage of air, will lead the experienced aurist to a correct diagnosis. Moreover, in serous catarrh the improvement produced by inflation of the middle ear will rapidly pass off, while in simple Eustachian obstruction it remains often for a whole day. To return to our subject, then, simple Eustachian obstruction is, I believe, a very rare affection excepting when due to naso-pharyngeal adenoids, and it follows that it can then be satisfactorily treated only by removing the cause. Further, most of the cases we meet with are in children, because if the child be neglected, if the adenoids be allowed to remain, and if recurrent attacks of deafness be permitted to continue, organic changes ultimately affect the intratympanic structures, and more or less incurable deafness will ensue. A somewhat interesting question meets us here. Is it always necessary to operate on adenoids in the case of deaf children? It is perfectly true that in a certain proportion of those afflicted with adenoids, only occasional attacks of deafness occur, and those at long intervals. Sometimes an acute middle-ear inflammation arises and is completely recovered from. My own practice in this matter is as follows: provided the adenoids do not materially interfere with other functions, and provided an attack of deafness has been completely recovered from, I do not operate until at least one other attack has occurred. Occasionally a patient suffering from adenoids has one attack of earache or of Eustachian obstruction, and under treatment with the air-douche hearing is perfectly recovered, never to be lost again. There can be no doubt, too, that adenoid hypertrophy sometimes disappears spontaneously, and this should always be borne in mind in considering the desirability or the reverse of operating. The nearer the individual approaches puberty, the greater is usually the tendency towards a shrinking of the adenoid tissue both of the faucial and

pharyngeal tonsils, and if the patient be above fourteen, the cautious surgeon will often hold his hand where, had the age been less, he would have operated forthwith. In considering, then, the connection between naso-pharyngeal adenoids and deafness, it is extremely important to remember that the amount of the ear affection does not always depend upon the size of the hypertrophy. I have seen cases where recurrent ear trouble was due to a very small amount of lymphoid tissue so situated that pressure upon the projecting orifices of the Eustachian tubes seemed to be produced. I write "seemed to be produced" advisedly, because such pressure was indicated by the rhinoscopic mirror. In such instances only a small amount of tissue can be removed by operation, but the effect is often very marked. I have drawn special attention to this form because it is so liable to be overlooked, as the patients show no direct evidence of nasal trouble.

Do naso-pharyngeal adenoids produce deafness only by causing obstruction of the Eustachian tubes? The answer must, I think, be in the negative, for it is well known that impaired hearing in a patient who has perforated tympanic membranes and adenoids is often permanently benefited by removing the naso-pharyngeal growth. Again, in a case of deafness the improvement permanently attainable by removing adenoids is often in excess of that immediately following inflation of the middle ear. Of course, in estimating the value of this chain of reasoning, it must be borne in mind that middle-ear deafness with perforated membranes is often favorably influenced by the employment of Politzer's bag, but in these cases it will generally be found that there has been some secretion in the tympanum, or that there have been delicate adhesions which have been influenced by the air-douche. My own view as to the effects of adenoids upon the hearing is that they act both by causing Eustachian obstruction, and by interfering with the circulation (either vascular or lymphatic) of the tympanum. In former times large tonsils were considered a fruitful source of throat deafness. We now know that enlargement of the faucial tonsils in a child is generally associated with a similar enlargement of the pharyngeal tonsil. Where both structures are hypertrophied it is probably well to remove them, but, so far as the hearing is concerned, adenoids are of immensely greater importance than enlarged tonsils.

As I have already stated, simple Eustachian obstruction is rare except from the above-mentioned cause, but we do occasionally meet with it from (1) simple naso-pharyngeal catarrh, (2) tumors, (3) ulceration, or rather cicatrization following ulceration.

It remains for us to consider the effects of other lesions of the nose

and naso-pharynx upon the Eustachian tubes,—lesions which are not included in any of the foregoing headings, and which are often said to require operative treatment for their cure. I may at once state that I do not now refer to such conditions as nasal tumors—polypoid or otherwise—which would demand removal on general principles quite independently of their effects upon the ear; neither do I include in my remarks cases of nasal obstruction where this is so marked as to make its removal desirable on other grounds. The class of cases I have in view are rather those in which Eustachian obstruction is supposed to be the cause of deafness, but in which the condition is usually one of fibroid change within the middle ear, and where some nasal condition exists which does not cause symptoms of importance, but is believed to keep up the ear trouble. It is very difficult to find the ideal nose as demanded by a certain class of rhinologists. He will almost invariably be able to find either a degree of hypertrophy of the mucosa or an irregularity of the nasal septum, and will, therefore, if he so wishes, be able to find a pretext for attacking the nasal chambers. I should like here to put on record my firm conviction that lesions of the nose—adenoids apart—which do not cause pronounced nasal symptoms are rarely if ever causes of deafness.

If nasal obstruction alone were a frequent cause of deafness we should expect to find impaired hearing a pronounced symptom of nasal polypus, but it is not so. It may be thought that in a paper of this kind it is not necessary to insist upon negative statements with regard to Eustachian obstruction, but the necessity becomes evident when it is remembered that by implication the teaching of a large number of authorities is, "If you find anything wrong in the nose, the treatment must be directed first and foremost to this part." There must, I repeat, be some discrimination, guided by a somewhat conservative and sceptical mind as to the universal utility of nasal operations in ear-disease.

CHRONIC MIDDLE-EAR CATARRH AND PROLIFEROUS CATARRH, ALSO CALLED OTITIS MEDIA HYPERTROPHICA, ETC.

It has seemed to me better to group the cases comprised under the above headings as "fibroid changes in the middle ear without preceding suppuration." They have with a few exceptions the following features in common.

1. An imperforate tympanic membrane,—sometimes indrawn, sometimes thickened, often normal, occasionally with a delicate shade of flamingo-red.

2. Increased bone-conduction. In such cases there is often an

element of Eustachian obstruction, and supplying air to the tympanum may improve the hearing although such improvement never approaches the normal. The pathological condition is always some fibrous or osseous fixation of the otherwise mobile portions of the tympanic apparatus. I have so far stated enough to identify the class of cases to which I refer and to call attention to the salient features of their pathology. It may be added that sometimes the fibroid changes are in the form of delicate adhesions which can be stretched by the action of air injected by way of the Eustachian tube.

I shall not be far wrong if I subdivide the cases which come under the above description into two great varieties, viz.,—catarrhal and non-catarrhal,—although the two may be and often are associated in the same individual. It is, of course, impossible to give any satisfactory account of the differential diagnosis of these two forms in a short article. Suffice it to say that in the catarrhal variety the hearing is adversely affected by a cold in the head, while in the non-catarrhal form additional deafness is often evoked by nervous exhaustion of any kind. Now it is just these cases which require care and discrimination with regard to nasal therapeutics of an active kind. I have already stated the limits which I consider should guide the aurist in dealing with the nose, and these limits must be taken as applying to middle-ear fibrosis as much as to Eustachian obstruction. Indeed, I have previously indicated that it is most commonly in the former that the question will arise.

The reader may now ask for definite indications, and I must admit that the question is difficult to answer. We have, as already stated, two forms of middle-ear fibrosis,—the catarrhal and the non-catarrhal. In the former we find on inquiry a history of repeated deafness following colds, each exacerbation leaving the hearing permanently worse; there is more or less evidence of nasal and naso-pharyngeal catarrh while the tympanic membranes are thickened and indrawn, and the Eustachian tubes may be more or less obstructed. In such cases the rules which have been laid down in connection with Eustachian obstruction should be applied, and, moreover, it is generally desirable—if operative interference be not indicated—to use remedies to benefit the condition of the nose and naso-pharynx in addition to treatment directed more particularly to the middle ear.

In non-catarrhal cases we often have a very different picture. We find a patient—frequently a female—with perhaps a history of hereditary deafness. Exacerbations are caused not so much by cold as by anything which exhausts or disturbs the nervous system,—e.g., fatigue, worry, childbirth, etc.

The nose and naso-pharynx may be perfectly normal or there may be some abnormality present, but be that as it may, there is commonly not much evidence of naso-pharyngeal congestion. The tympanic membranes are often quite normal, although an abnormally clear outline of the malleus may be apparent to the skilled observer. Sometimes we see a delicate shade of flamingo-red which is in my experience strongly suggestive of ankylosis of the ossicles. Now in such cases, as I have said, we may meet with gross nasal lesions which in the catarrhal variety would make operative interference justifiable and, perhaps, even desirable. In the typical non-catarrhal variety I would, however, advise the operator, as a rule, to hold his hand, for the following reasons :

1. The deafness is often increased by any shock, and the nervousness engendered, by prospective interference, together with resulting hemorrhage, may make the hearing worse instead of better.
2. Although we ascribe this class of cases to ankylosis of the ossicles, it is probable that the labyrinth is also involved in a considerable proportion of instances.
3. Operative measures directed to the removal of nasal abnormalities do not benefit the hearing, even when there is a degree of Eustachian obstruction.

The combination of symptoms I have so briefly sketched is not very frequently associated with the presence of adenoids, because, as a rule, the patients are adults. Occasionally, however, we meet with them. A cushion of hypertrophied pharyngeal tonsil is then seen and felt between the orifices of the Eustachian tubes. I have, however, not found that, in this type, the removal of the tissue in question has been followed by any good result whatever. In the non-catarrhal form of middle-ear fibrosis we rarely meet with other gross nasal lesions requiring operations on their own merits, and I cannot too strongly deprecate the removal of small spines, slight hypertrophies, and the like. Again, it is important to bear in mind that treating a granular pharyngitis by means of the electric cautery cannot possibly benefit deafness which is due to fibroid or osseous changes in the middle ear.

I have thus touched upon merely the outlines of a subject which is ripe for more extended discussion, for there can be no doubt that patients have in the past suffered both from too great enthusiasm on the part of those who regard most forms of middle-ear deafness as depending upon some pathological condition of the nose and throat and from neglect in recognizing the connection between tympanic disease and the naso-pharynx where it really exists.

INFLUENZA AND DISEASES OF THE EAR.

CLINICAL LECTURE DELIVERED AT THE POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL.

BY SETH SCOTT BISHOP, M.D., LL.D., Chicago,

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GENTLEMEN,—It was not at first our intention to treat of influenza in its epidemic form, but rather as it has always been known, as a common catarrhal affection. This would admit of a consideration of coryza, hay-fever, simple pharyngitis, Eustachian tubal catarrh, and the resulting middle-ear diseases.

But in view of the fact that the epidemic form is now reported to have invaded London, Manchester, Birmingham, and Liverpool, we may expect soon to be brooding over our own troubles from a visitation of this old enemy. Such we may call it, for, contrary to the prevailing impression, it is not a modern disease. Indeed, it is a classical complaint.

We will first treat the subject from the broad stand-point of a general practitioner and afterwards from the point of view of a specialist in nose, throat, and ear diseases. Epidemics of influenza date back beyond the Christian era, and, as early as the year B.C. 415, the Athenian army in Sicily was afflicted with this trouble. According to Buckingham, there is a periodical outbreak of a similar disease occurring twice a year, in January and August, in the Caroline Islands, from which nearly all the inhabitants suffer. But this is very suggestive of hay-fever. In the year 1510 the British Islands were visited by a very extensive epidemic of influenza, but up to that time no exact records of it were written. Since that period there have been more than twenty outbreaks of a severe type, besides many minor ones. The disease usually is first manifested in the far East, generally in some part of Russia, and travels rapidly from east to west. The

greater the facilities for rapid transit the faster it invades the western countries. It has travelled from near St. Petersburg to New York in six weeks. It prevails in all climates and attacks all classes of society. While it has been made the butt of jest by the uninformed masses and the subject of ridicule by the unthinking triflers in medicine, it is more to be feared than small-pox or cholera. It cannot be quarantined and controlled by protective measures like those diseases, and when it does not kill it blights and withers and leaves its deadly sting to blot out one's sight or hearing or reason, or sows its morbific seeds in other organs to insure its victims future maladies. When it first appeared in Paris its effects were worse than any of the three epidemics of cholera during the thirty years preceding 1884. The influenza epidemic of 1891 in Chicago, lasting about six weeks, produced the highest mortality the city had ever known.

The exact nature, cause, and method of origin and propagation of this disease are not yet definitely determined. It is easier to say what it is not than to say what it is. It is not a simple catarrhal affection. It is a specific infectious and contagious disease. It is believed by some to be caused by peculiar atmospheric conditions, which would account for its rapid extension over a large part of the globe and appearance in widely-separated places at nearly the same time. We know that the upper strata of the atmosphere in which volcanic dust is disseminated will carry these particles to the remotest regions of the earth, and that dense poisonous gases evolved from subterranean sources may be extruded into the great ocean of atmosphere about us and prove detrimental to animal life.

During some invasions, meteorological records have shown high barometric pressure, drought, northerly winds, cloudy sky, diminution of ozone, and low electrical charge of the air. While the prevailing winds have varied greatly in different countries during the same epidemic, extremely dry air has been a constant factor. This unusual dryness of the atmosphere and earth has led some to believe that the consequent liberating and floating of the resulting dust in the air, its inhalation and irritating effects upon the respiratory passages, accounted for attacks. But a severe epidemic arose in Russia while the country was covered deeply with a carpet of snow, and, moreover, the respiratory system is not always involved in the manifestations of the disease.

It is claimed by some observers that the epidemic does not travel faster than man does; that obstacles to travel, like mountain ranges, obstruct its progress; that the most popular means of communication

between people of different countries form the routes by which the disease progresses, and that it first gains footing in large cities where persons congregate in the greatest numbers,—in post-offices, factories, schools, banks, etc. All these facts point to the harboring and conveying of the germs of influenza by human beings. From all data that have been collected thus far, it is a natural conclusion that it is both infectious and contagious.

Various bacteria have been found in the sputa of persons suffering from this disease. Staphylococci and streptococci were especially abundant, but it is still an open question as to what actually constitutes the specific infection that gives rise to the attack. Some observers believe that the true influenza bacillus has been found, while others are of the opposite opinion, and suggest that the micro-organisms found may be the product instead of the cause of the disease.

It seems reasonable to assume, from the rapidity with which the whole organism shows the presence of infection, that it first enters the blood. No other theory advanced satisfactorily accounts for all the phenomena present.

The variations of the disease as it appears in different individuals, and even in the same person, can best be treated under three natural divisions of the subject: (1) As it affects the nervous system; (2) the alimentary canal; (3) the respiratory tract, including the Eustachian tube, middle ear, and pneumatic cells of the mastoid process. We are especially concerned with the latter form to-night.

It is not common to see all of these forms affect the same patient at the same time, but it is not uncommon to see two of them coexist. For example, the great mental depression and extreme prostration of the muscular system that first make their appearance may be quickly followed by the gastric and intestinal disturbances that add to the exhausted condition already present. We often see the nervous and respiratory forms combined, but not the simultaneous invasion of the air-passages and alimentary canal. Two of the three forms are sometimes consecutive to each other. To illustrate: One of our younger professors was attacked during the epidemic with vomiting and purging and general prostration, from which he nearly recovered in five days, when he was seized with sneezing, running at the nose, sore throat, hoarseness, and mild bronchitis.

Chilliness and heat may often be marked when the temperature rises only one or two degrees. But the rise is often to 103° or 104° F. In addition to a sudden sense of great fatigue there often occur shooting pains in the head, pain and muscular soreness in the extremities or

abdomen, aching of the back and loins, and, in the respiratory form, coryza, pharyngitis, and often an invasion of the deeper air-tract.

We have observed that patients with an unusual manifestation of middle-ear disease begin to present themselves in both private and dispensary practice about one week after we become conscious of the presence of an epidemic of influenza. They often repeat this story: "Doctor, I was taken a few days ago with a cold in my head, and I had great pain in my ear last night, and it broke during the night and ran blood and water." They present a picture of acute suffering, anxiety of countenance, weakness of the limbs, coated, indented, and tremulous tongue, and complain of pain radiating over the corresponding side of the head. The mastoid is more often involved than in the simple middle-ear inflammation as seen between epidemics. The external ear-canal is found to contain bloody serum; the drum-head is red, swollen, and bulging, and the tympanum is filled with discharge. The hearing is usually much impaired.

The prognosis in such cases without treatment is unfavorable. The mastoid process and nervous centres are prone to participate in the inflammatory action as it progresses beyond the narrow limits of the tympanic cavity. The mastoid is sometimes invaded within twenty-four or forty-eight hours after the first symptoms are noticed, and with each recurring epidemic we have observed a larger proportion of cases in which the mastoid inflammation developed. But we have been able to cure a majority of the cases without recourse to mastoid operations.

Let us assume that we have a typical case affecting the upper respiratory tract, including the ear and mastoid cells: sometimes, but not invariably, sneezing; nasal obstruction and watery mucous discharge, suffusion of the eyes and flow of tears, sore throat, inflammation of the Eustachian tube, middle-ear and mastoid process, with sero-sanguineous discharge from the external canal, pain, redness, tenderness, and swelling in the mastoid region. We put the patient to bed and see that the bowels are free. If the temperature is high we reduce it with antipyrin or one of its efficient substitutes, and, to relieve pain, give these tablets, containing a combination of morphine, atropine, and caffeine, in the proportion of one-twelfth grain of morphine with one-six-hundredth grain of atropine and one-sixth grain of caffeine, repeated as necessary. The morphine relieves the pain and nervous irritability, suppresses the excessive secretions and stimulates the circulation; the atropine elevates the tone of the blood-vessels, quickens the pulse, decreases all the secretions except from the kidneys, stimulates the res-

piratory centre, and counteracts the constipating effect of the morphine, and the caffeine stimulates the nervous centres and the kidneys and diminishes the tendency of the morphine to produce nausea. The sneezing and nasal discharge cease, the nostrils open up, and the pain disappears. We treat the nose and throat with a three-per-cent. solution of camphor menthol in lavoline with the atomizer morning and evening. The ear is gently syringed with a warm solution of bichloride of mercury in water (1 to 5000) as often as the discharge returns. After each thorough cleansing of the external canal we cautiously inflate the middle ear and dry the canal with absorbent cotton. Aristol is dusted upon the drum-head with the pocket powder-blower, and the ear closed lightly with cotton.

For the mastoid inflammation the mastoid ice-bags, filled with crushed ice, are applied continually. If the ice-bags cannot be readily obtained, mustard paste should be used sufficiently to cause intense redness for several days, but without blistering. You may not be able to subdue every mastoid inflammation by this means, and, if an operation is unavoidable, the sooner it is performed the better for your patient. But we cure the majority of acute inflammations now without operations, and this is one of the most important and life-saving accomplishments of modern medicine. It saves the patient from one of the most delicate, difficult, and dangerous of operations.

CHRONIC DRY CATARRH OF THE MIDDLE EAR; IMPACTED WAX IN THE MEATUS.

CLINICAL LECTURE DELIVERED BEFORE A POST-GRADUATE CLASS.¹

BY L. JACOBSON., M.D.,

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GENTLEMEN,—The patient I am about to present to you came to the polyclinic an hour ago complaining that he had all at once lost the power of hearing. He states that his deafness came on suddenly yesterday, immediately after a cold bath. Questioned particularly as to the previous condition of his ears, he says that he has never noticed any discharge, nor has he ever suffered with pains. But he thinks that for a year or more his hearing has not been as good on the left side as on the right. He first became aware of this by observing that he was not able with his right ear resting on the pillow to hear the watch beside his bed. He was also often troubled with a singing or rushing noise in his left ear. Latterly his hearing on the left side has been growing worse.

The patient's statement that his hearing has undergone a sudden and considerable impairment immediately after a cold bath, without pain, points to the presence of impacted wax in the meatus. The sudden interference with hearing developed in such cases is referable to the action upon the wax of water which has found its way into the meatus. Wax may be present there in great amount without giving rise to any symptoms or in any way affecting the hearing, but upon water entering the canal it is apt to swell up to such a degree as to suddenly obstruct the meatus, thereby seriously interfering with hearing, and even occasionally almost rendering whispered words inaudible. We frequently find associated therewith subjective auditory sensations, such as rushing and hissing noises, a feeling of fulness and pressure within the ear, and, rarely, vertigo. Upon examining the right ear with the speculum our surmise proves correct. We find a dark-brown glossy

¹ Reported by H. Cleves-Symmes, M.D.

mass obstructing the canal and blocking it so completely as to leave no part of the drum-head visible.

Turning now to the left ear we notice the meatus to be a trifle dry, and not lined with wax. The drum-head presents the symptoms of pathological retraction,—viz., the short process of the malleus stands out from the membrane more than normally; the posterior fold is likewise unusually prominent in shape, of a sharp whitish-gray ridge starting from the short process and passing back horizontally almost to the margin of the drum; the handle of the malleus has assumed a more horizontal position and a greater inclination inward and backward; and finally, for the same reason, the manubrium appears foreshortened. Furthermore, the tympanic membrane generally is found considerably thickened, owing to interstitial proliferation within the substantia propria. Its transparency is thereby diminished, and its color changed from the normal yellowish gray into grayish white. On this whitish-gray ground several small, dark, round areas are visible, marked off from their surroundings with blurred margins. Small dark areas like this might be either taken for cicatrices or atrophied spots. The former assumption is negatived by the fact of their passing over into the surrounding tissue by a zone of gradual transition, whereas cicatrical spots, as a rule, are distinguished by sharply-defined borders. Their number furnishes another argument against their being of a cicatrical nature. The simultaneous presence of more than three cicatrices in one and the same drum is a very rare occurrence indeed. As the entire membrane in this case shows considerable interstitial thickening, and, in consequence of this, an abnormal grayish-white coloration, we are not obliged to regard these dark spots as being atrophic. It is more probable that they represent the only parts about the drum that have retained their normal thickness and transparency, and which now, contrasting with their opaque and more whitish vicinity, give the impression of being darker.

Pathological alterations about the tympanic membrane, such as are present in our case, are by no means necessarily associated with any considerable impairment of hearing or with any other kind of subjective aural symptoms. On the contrary, we often, in cases exhibiting the same morbid condition of the drum-head, note the absence of subjective symptoms, and we find the whispering test to give just about normal results. This fact, which has been proved by experience, is of great interest from a theoretical point of view, inasmuch as it shows in an incontrovertible manner, to my mind at least, that in the organ of hearing anatomical deviations from the normal do not by any means

always go hand in hand with functional deficiency. From this we may, in the present case, draw the practical inference that we have no right to simply attribute to the diseased state of the tympanic membrane the sensations in his left ear, and the impaired audition whereof the patient complains.

This pathological thickening of the drum-head is in rare instances the residue of an idiopathic inflammation of the membrane (myringitis) which has run its course; it is much more commonly, however, on the evidence of pathological investigation post mortem, associated with similar alterations in the mucous lining of the middle ear, alterations which may be either the residue of a former catarrhal inflammation of the middle ear, or which may be due to the so-called "dry chronic catarrh of the middle ear." In this last-named condition we find the mucous membrane of the middle ear thickened by connective-tissue proliferation, thereby hampering more or less the movements of the oscillating apparatus (tympanic membrane, ossicles, membrane of the *fenestra rotunda*, and *ligamentum annulare stapedis*); further, we often observe it to be partially calcified or ossified, or subject to partial atrophy. At the same time we meet with adhesions, false ligaments, and membranes spread between different parts of the tympanum and abnormally fixing them; this newly developed tissue likewise may inclose deposits of lime, or be partially ossified. It stands to reason that gross anatomical alterations such as these within the tympanic cavity almost infallibly interfere with the free action of the sound-conducting machinery, thereby prejudicially affecting the power of hearing. Of course, as long as the patient is alive we have no means of ascertaining whether or no such a condition obtains within the tympanum, and accordingly we cannot tell in the case of this man whether such changes are not absent. This hardness of hearing in the left ear, dating a year back, according to his statement, would then be referable either to a former myringitis, or to disease of the labyrinth or of the sound-perceiving apparatus, which is completely inaccessible during life.

Our next step, in order to differentiate between these different diagnostic possibilities, will be to examine the actual state of his hearing. If we find it to be considerably impaired, that shuts out a preceding idiopathic myringitis,—a rare disease any way, and one that even during its active period but very slightly interferes with hearing. In that case one of the other frequently occurring affections mentioned above may be assumed to be or to have been present,—viz, a former secreting catarrh of the middle ear, a former inflammation of the middle ear, dry chronic catarrh of the middle ear, or, finally, an affection of the

labyrinth or of the sound-perceiving apparatus. It is also quite possible that this last-named condition is combined with one of the others, particularly with chronic dry catarrh. I think we are safe in excluding a former inflammation on the strength of his never having suffered from pains in the left ear, although, possibly, such disease did occur in infancy, without his having any recollection of it. His statement as to the time—one year—since his hearing power has decreased is of little weight, since unilateral impairment of audition is apt to be overlooked so long as the other ear is of normal power.

To turn to the examination of his hearing, we shall first of all, following our usual sequence, test his ear by whispered words. I find that he is able to make out the whispered word "drei" (= three) at a distance of two metres,—that is to say, that his power of hearing in the left ear is considerably diminished. As to testing with a tuning-fork, which many authorities regard as an *infallible means* of distinguishing between affections of the middle ear and those of the inner ear, I have told you in the course of previous lectures that I do not share this view, and I have given you my reasons, which, by the bye, you will find set forth at length in my "Text-Book on Otology." According to my opinion the tuning-fork merely establishes an uncertain diagnosis. I do not therefore think it necessary to perform this test in the present case. I may have recourse to it later on if by catheterizing the Eustachian tube I should fail to improve his hearing.

The next thing to do is to catheterize the left Eustachian tube. By simultaneously auscultating the ear we may be able to gain data of some diagnostic value. We find, indeed, that the current of air, as it enters the tympanum, is of less than normal force, and that its rushing sound is mixed with *râles* (both deep and sibilant). This proves the presence of irregular swelling and thickening of the mucous lining of the tube, whereby the passage is abnormally narrowed, a condition often encountered in chronic dry catarrh and after inflammation of the middle ear. Now, immediately after having catheterized him, we shall again test the patient's hearing. We find it considerably benefited thereby, he now being able to understand the word "drei" at four metres distance. You have noticed that in testing him a little while ago and now again I have whispered to him a great number of words and numbers, substituting new ones for the second test. This is absolutely necessary if you wish to avoid coming to wrong conclusions. Had I both times used no other word but the same numeral "drei" to test him by, then it would not be wonderful if we noted considerably more improvement, even though no air at all had penetrated as far as

the tympanum. For where the same words are repeatedly used the patients gradually learn to divine them, and they are generally thus enabled to repeat them at a much greater distance in the course of the second testing. That is the reason why it is essential to throw difficulties in the way of such guessing by giving the patient a great number of different words, among which it is advantageous to have many of similar sound as the test-word.

So far we have ascertained that the hearing of the left ear has been improved by the catheterization. We shall now inquire of the patient whether the same is the case with the rushing noise in his ear. He replies in the negative.

This is a subject to which I shall revert later on when speaking of the treatment. Continuing our diagnostic disquisition we may conclude with a certain assurance, from the success of catheterization, that we have not in the main to deal with disease of the labyrinth or of the sound-perceiving apparatus. In such cases, as a matter of experience, the catheter is of small avail, never causing much improvement. Furthermore, our patient has never exhibited certain symptoms common in such a disease,—namely, vertigo, nausea, and vomiting. I do not mean to imply thereby that the labyrinth and the sound-conducting apparatus are quite sound ; that is a question not to be decided during life according to my view of the matter. The essential seat of disease I take to be the middle ear, else the hearing would not have experienced so much benefit by catheterization. By future observation we may be able to tell whether we have here the outcome of a preceding catarrhal inflammation, or whether the case is one of so-called chronic dry catarrh. In the latter disease we may expect a steady deterioration of hearing to take place ; not so in the two first-named affections. It is too early to-day to differentiate between these conditions, although the history of the case points rather to chronic dry catarrh of the middle ear, since we are told that the development of his deafness has been gradual. For the sake of the prognosis it would be valuable, indeed, to have this point decided, for in chronic dry catarrh the deafness generally is progressive. From a therapeutic point of view, however, this distinction is irrelevant, since the treatment is the same for both conditions.

Turning now to the therapeutic aspect in these conditions,—dry chronic catarrh of the middle ear, or the residue of a previous catarrhal inflammation of the same,—the first remedy to employ is inflation of the tympanum, preferably by means of the Eustachian catheter : in unilateral disease there is no alternative but this instrument. In the

beginning this should be done two or three times a week, later on with greater intervals, the treatment to be continued as long as each application is followed by an immediate improvement, especially of the hearing. By pushing the treatment beyond this point we are more liable to do the patient harm than to benefit him. It is necessary, therefore, to test the hearing before and after each application of the catheter. The aim of inflation is to restore the drum to its proper position ; to break down false ligaments and membranes, or, if they are too resistant, at least to stretch them ; by passive motion of the drum and ossicles to loosen the unyielding mucous membrane enveloping the sound-conducting apparatus.

Where inflation of air induces little or no improvement in the hearing, or where the hearing is improved but the subjective sensations remain unbefited, *Luce's spring pressure probe* (federnde Drucksonde) should be employed. We shall use it on our patient the next time, as the rushing noise in his ear persists in spite of the inflation. I am averse to applying it to-day, as it is my rule only to use it *before* air has been driven into the tympanum. I shall show you the instrument, however.



LUCE'S SPRING PROBE.—*a*, hollow cup; *b*, piston gliding in *c*; *c*, stem with concealed spiral spring.

You observe that it bears an enlargement in the shape of a hollow cup at its termination, which is applied to the short process of the hammer. In order to avoid unnecessary pain it is well to wind some cotton-wool around this, pressing it into the hollow of the cup with a probe. You introduce it into the meatus by the light of a reflector with the usual precautions (the patient being seated, and his head held by some one), and you gently press perpendicularly against the processus brevis, using the instrument in the manner of a piston. A spiral spring concealed in the thicker part of the stem serves to equalize the pressure exerted. If the operator has a delicate touch the pain thus occasioned is very inconsiderable, unless the membrane or the ossicles are rather rigidly held in place by adhesions or attachments. In that case you should set your piston in motion not oftener than once or twice ; otherwise you may do so from four to eight times, or even, later on, from twenty to thirty times. It stands to reason that this method, in rigidity of the chain of ossicles, is both more powerful and more rational than inflation. The latter spends its action on the non-resistant, comparatively healthy parts of the tympanic membrane,

causing them to bulge out, but it is comparatively inefficient as regards its action on the sclerotic portion supported by rigid ossicles. It is natural, therefore, that the domain of the spring-probe embraces particularly cases unbefitted by mere inflation, and makes it possible in such cases frequently to secure good results.

Sometimes I must say that the hearing does not undergo an improvement, or that it is even found to be worse, after the use of the probe. In that case I have made it my rule to follow up the probe with the catheter, and I have observed the hearing to be benefited in numerous cases where catheterization alone did not avail. Likewise in all but very exceptional instances, any aggravation resulting from the probe is sure to be neutralized by the subsequent inflation. After the application of the probe I tell my patients to keep the meatus closed with a pledget of cotton-wool for the rest of the day, because generally there has been set up a slight irritation of the drum-head, evidenced objectively by vascular injection about the manubrium of the malleus, and subjectively by transitory sensitiveness.

This finishes the list of mechanical remedies in which my practice has taught me to trust. I have never observed any benefit worth mentioning to accrue from the injection of fumes or medicinal fluids into the tympanum by means of the Eustachian catheter, as recommended by some authors. Nor have I any confidence in operative measures for the purpose of breaking down adhesions, or mobilizing the ankylosed ossicles, or severing the retracted tendon of the tensor tympani. It must be borne in mind that the tympanum by way of the Eustachian tube is in free communication with the pharyngo-nasal cavity, and that it is impossible, therefore, to guarantee that the wound caused by an operation can be kept aseptic. Secondary inflammation from this source is apt to leave the ear in a worse plight than it was before operation. Further remedial action on our part is therefore confined to the symptomatic treatment of the subjective auditory sensations, which are sometimes very distressing, and to the establishment of a certain dietary regimen. As regards the first of these two points, in cases where the mechanical treatment has failed to relieve the patient's subjective sensations, I generally begin by prescribing a bromide.

R. Potassii bromidi,
Sodii bromidi, $\frac{aa}{3}$ i;
Ammonii bromidi, $\frac{3}{ss}$;

M.—Aqua destillata, q. s. ad $\frac{3}{v}$.

Sig.—One tablespoonful to be taken two or three times a day in a glass of Seltzer water ten minutes after a meal.

Of this solution the patient may take three bottles in succession, then after an intermission of a week or two he can take the same medicine again, if necessary. It proves particularly useful in cases where the patients complain of their sleep being interfered with by the noises within the ear. In cases unbefited by this medicine I prescribe quinine in infinitesimal doses.

R. Quininæ hydrochloratis, gr. iii;

Pulveris althææ,

Extracti gentianæ, aa q.s.

M.—Et flant pilulæ No. xx.

Sig.—One pill to be taken three times a day.

These pills are to be recommended especially for anæmic patients in whom the subjective sensations have developed in consequence of mental overwork. They are further of use in cases where the noises are associated with vertigo. It happens occasionally that the drug, even when administered in these homœopathic amounts, aggravates the subjective auditory sensations, in which case it should of course be stopped.

If in the course of ear-disease there should occur a sudden and decided increase of the noises, then I would advise the application to the mastoid region of an emplastrum cantharidum ordinarium (containing cantharis in the proportion of one to four). After twenty-four hours the blister that has developed should be carefully incised and the raw surface encouraged to heal by simple dressing. If the increase in the noises is due to the development of acute catarrh, then blistering is generally superfluous, a simple inflation of the tympanum with air being all that is required. In patients with a tendency to congestion of the head hot foot-baths (of 37° R.), with or without the addition of mustard, may prove very beneficial in their effect on the auditory sensations; the time for taking them is just before going to bed. A systematic course of purging is likewise to be recommended.

As regards the preventive treatment, patients must avoid whatever is liable to bring on a cold; they should never take cold baths or Russian or Roman baths; they should not apply water to the scalp, but rather use readily evaporating spirits for washing the head; this they should do in the evening when there is least danger of catching cold. Further, they should keep out of the way of very loud noises so far as their vocation and the circumstances of their daily life will permit. Quinine and salicylic acid are not to be used.

Now, finally, we shall have to busy ourselves with the right ear, about which the patient came to consult us. Unless the patient is pressed for

time I would advise you before syringing to previously soften the impacted wax by filling the meatus with a one-per-cent. sodium carbonate solution at the body temperature ; this is left in the meatus for five minutes, then the ear is dried, and a plug of cotton-wool put in. It is well if the patient after this keeps to his room for an hour or so. After some four or six repetitions of this the wax has generally become sufficiently soft to be easily removed by mild syringing ; if not, the instillations must be continued. It is essential—and that is my reason for recommending you to previously soften the wax—to avoid force in syringing the ear. All attempts at removing an obstructing plug of ear-wax by means of hooks, forceps, etc., are decidedly to be deprecated. After the wax has been gotten out a cotton-wool plegget should be kept in the meatus for two days at least, or even longer if the ear proves sensitive to noise. If after two days the hearing still remains defective, the inflation of air should be practised. One single inflation is often sufficient to restore normal hearing. In that case we may assume the deafness to have been due to abnormal protrusion inward of the tympanic membrane by reason of the wax or through the pressure used in syringing. If the deafness fails to yield to inflation once applied, that proves the presence of some other affection of the ear requiring a special treatment in its turn.

Dermatology.

DISEASES OF THE NAILS.

CLINICAL LECTURE DELIVERED AT THE MEDICO-CHIRURGICAL HOSPITAL OF
PHILADELPHIA.

BY JOHN V. SHOEMAKER, M.D., LL.D.,

Professor of Skin and Venereal Diseases in the Medico-Chirurgical College and
Hospital of Philadelphia.

GENTLEMEN,—Nail contributes materially to the value of the fingers as organs of touch and prehension. Histologically it is but a modification of the epiderm. Although an extravascular tissue, it is intimately connected both in position and development with a matrix and bed richly supplied with blood-vessels and nerves. Nails receive their nourishment both from the matrix and the bed upon which they repose. Various conditions of disease affect the lustre and the color of the nails and produce visible changes in their structure. Pathological alterations of the nails may be of constitutional or local origin. Much, therefore, may be learned by an attentive observer from mere inspection of the finger-nails. Their rosy hue is lost in anaemia and replaced by a dull pallor. They are pale in chlorosis also, and in progressive anaemia they may undergo structural change. They are deadly white in leucocytæmia. Scurvy may occasion loss of the nails. In most cases of chronic rheumatism in people over forty years of age, the nails are abnormally thickened and in many instances they are also furrowed. A dissimilar change occurs in gout. In that disease the nails are apt to become fragile and easily break. They likewise lose their lustre. Loss of the nails occurs so commonly in diabetes that such a history should cause us to suspect the incipiency of that disease, and to examine the urine for sugar. In pulmonary tuberculosis the nails are frequently curved and thickened. Alterations may also be produced by scrofulosis. The nutrition and aspect of the nails may be variously influenced by syphilis. Many organic and functional diseases of the nervous system so profoundly modify the nutrition of the nails as to cause their loss or structural alteration. Peculiar alterations appear in the nails in the course of, or subsequent

to, various fevers and other serious maladies. White spots, lines, or furrows, thickened ridges and grooves are the commonest indications of preceding illness. After typhoid fever they are often crossed by transverse bands or furrows. White bands or grooves are also observed in consequence of typhus fever. The lesions of small-pox have been known to form beneath the nail. During the early stage of fractures the growth of nail is delayed, but is renewed as the process of repair advances. White bands have likewise been witnessed after attacks of acute rheumatism and relapsing fever. The nail tissue in the situation of these bands is brittle and easily broken. Transverse furrows may occur after sea-sickness, diarrhoea, and prostration from overwork. A depressed condition due to anxiety may produce the same effect. Nails will only grow to a certain length, and about six months is occupied in the progress from the matrix to the free extremity. A band or furrow in the centre of a nail points to an ailment of about three months previously.

You may, therefore, perceive that it is possible to gain some knowledge of a patient's history merely by inspecting his finger-nails.

I have hitherto confined my remarks to the influence of general conditions. The nails are, however, subject to a variety of alterations dependent upon local causes. Diseases of local origin may be divided into those due to traumatism, to the presence of some cutaneous malady, and to parasitic agency.

Hypertrophy of the Nail—Ingrowing Nail.—I have now to call your attention to two patients who exemplify different forms of local disease of the nails. The first is a man, fifty-seven years of age, a laborer. As he bares his right foot you will see that the nail of the great toe is excessively thickened and raised so as to form a sort of wedged-shaped horny mass. The nail is somewhat lengthened, but its principal increase is in thickness. The surface is dull, rough, and of a dingy yellowish hue. The nail has been in this condition for several years. Fortunately for the man it has grown more in the centre than at its sides, so that it has caused him little or no pain, and annoys him chiefly by some difficulty in fitting shoes and stockings. This case affords a very good illustration of what is known as hypertrophy of the nail. There has been an enormous overgrowth. In this affection the increase may be in length or thickness or both combined. The nail may not be equally thickened in all its parts. When the chief gain is in length, the free extremity is often curved into fantastic shapes, and may assume the appearance of a veritable claw or talon. Hypertrophy in general is sometimes called onychauxis, though this

name is also used to designate other forms of abnormal growth, as the development of two nails upon the same finger or toe, or the formation of a nail in unusual situations. Hypertrophied nails always lose their lustre, and their color varies from yellow to black. They are generally hard, but are often brittle and sometimes soft. Hypertrophy usually attacks the nails of the toes. When the finger-nails are involved the sense of touch is seriously impaired. Extreme overgrowth and distortion of the toe-nails may render walking difficult and painful. Hypertrophy of the nails is most frequent in old age, and is generally caused by neglect of bathing and of keeping the nails properly trimmed, together with inattention to other matters of personal cleanliness. The pressure of ill-fitting stockings, shoes, and gloves may be the source of hypertrophy. There is a form of nail hypertrophy which involves the lateral edge and particularly the inner border of the great toe. This condition, which is known as ingrowing toe-nail, is caused by ill-fitting foot-wear, and may develop at almost any age. It is often seen in young people of either sex. The edge of the nail pressing against the soft parts gives rise to inflammation, attended by acute pain. The parts become swollen, ulcerated, and covered by pouting granulations, which furnish an offensive discharge. The nail acquires a dirty brown or black color.

In cases such as that before us, the papillæ of the matrix and nail-bed are enlarged. In order to rectify aberrant local nutrition internal remedies are sometimes serviceably given. Preparations of sulphur, arsenic, or iron may be administered for this purpose, and are, of course, especially indicated if there is notable impairment of the general health. Local treatment, however, must constitute our main reliance. In this case the overgrowth shall be removed by means of cutting-pliers or a fine saw. When the nail is brittle the knife or scissors may be used. If these cases are seen early much good can be accomplished by paring the free edge and keeping the little overlapping fold of skin pressed backward from the sides and base of the nail. At the same time an ointment of the oleate of tin or lead is applied around the margins.

Inrowing nails may, in the beginning, be effectually treated by gently inserting a small piece of absorbent cotton between the nail and skin. The nail is thus gradually raised and can be removed without pain. Another plan is to paint the solution of gutta-percha in the interstice between the nail and soft parts, by which process, after it has been practised for several days, the nail is raised and can be cut away by the scissors. Most patients who come before us, however, have been

temporizing with various methods of domestic treatment and have reached an advanced stage. Under these circumstances I am in the habit of applying the solid stick of lunar caustic or pure carbolic acid to the granulations, after which a little pledge of cotton can be pushed beneath the edge of the nail. By repeating this procedure a cure is eventually obtained without causing much suffering, and the patient need not lose time from his work. In my experience it is seldom necessary or desirable to resort to more radical surgical methods.

Atrophy of the Nails.—Our second patient is afflicted with a precisely opposite condition. A woman, thirty-seven years of age, complains that the nails of all the fingers of the right hand, except the thumb, have become brittle, split, and break easily and seriously embarrass her in her occupation, that of an upholsterer. The nails have been in this condition for six months. The only cause to which she can attribute it is that a few months before she noticed anything amiss she had accidentally received a rather smart blow across the tips of the fingers. It did not cause much pain at the time, was followed by no immediate consequences, and the event faded from her recollection.

This woman's nails are shrunken in size and flattened; they are unusually thin and flexible. They are pitted and have a worm-eaten appearance. The color is scarcely, if at all, altered.

This is a case of atrophy. Any cause which affects the matrix and bed may be followed by an imperfect nail-formation. This patient is in good health. Nothing prevents her from pursuing her accustomed avocation but the trouble with her finger-ends. I think for that reason that her theory of the origin is correct. She needs no internal treatment. As a local measure which tends to produce healthy growth, an oil, as cod-liver oil, shall be applied to the nails several times a day, and in the intervals they will be covered with oleate of zinc ointment surmounted by a layer of wax.

Other Diseases of the Nails.—In concluding my remarks, I may avail myself of this opportunity of alluding to other diseases which may attack the nail. A form of onychia, known as onychia maligna, is sometimes met with in children. It is more common upon the fingers than toes. After some weeks of pain the nail-bed becomes red and swollen, ulceration subsequently takes place, gradually involving the entire bed and matrix. The nail becomes discolored and is eventually cast off, either as a single piece or in fragments. It does not always fall, however, but is sometimes curved and thickened. The disease is very chronic, and most cases appear to be local manifestations of tuberculosis. Constitutional treatment is demanded. As regards

local measures some slice off the nail-groove and scrape the matrix. Others either remove or raise the nail under anaesthesia and cover the ulcer with powdered nitrate of lead, iodoform, bromide of potassium, aristol, europhen, or other stimulating or antiseptic agent.

Certain occupations produce disease of the nails by frequent contact with irritant substances. Confectioners are liable to a certain form of onychia. The nails of dyers, tanners, and bartenders are apt to become diseased.

Eczema and psoriasis sometimes involve the nails, giving rise to alterations which are not very dissimilar in the two afflictions. The diagnosis will, therefore, principally depend upon the coexistence or former presence of either eczema or psoriasis, the disease of the nail being identified with that of the skin.

Corns and callosities may form beneath the nail. Other morbid growths occasionally develop in the same situation.

In pityriasis rubra the nails are thickened, deformed, and opaque. In scleroderma of the fingers the nails are deformed and atrophy, until at last they are represented only by a small and formless piece of horn.

The acarus scabiei sometimes attacks the nail. Ring-worm and favus have likewise been known to attack this structure. The nail grows brittle, discolored, and opaque. Parasitic disease of the nail, however, is almost unknown in the United States.

WINTER DISEASES OF THE SKIN.

CLINICAL LECTURE DELIVERED AT THE MEDICAL COLLEGE OF WESTERN RESERVE UNIVERSITY.

BY WILLIAM THOMAS CORLETT, M.D., F.R.C.P. (Lond.).

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GENTLEMEN—We have before you to-day some unique diseases of the skin which have been produced by exposure to cold. In a general way they resemble other well-known types, so that one is at a loss to say whether or not they should be regarded as a distinct class. There are, however, certain distinctive clinical features which I shall endeavor to show you, and which I believe entitle them to special consideration.

The patient before you is a man of middle age, of strong physical development, and has all the outward semblances of health, yet he is afflicted with an itchy disease of the skin. He says it has existed many years, coming on yearly with the first approach of frost, continuing during the winter, and disappearing of its own accord at the advent of spring.

The disease was first pointed out by Dr. Duhring, of Philadelphia, in 1874; it is a common affection in this climate, much more so than statistics show, because many cases go on from year to year without seeking medical aid, as this man has done. The most perfect picture, clinically, of winter itch, as Jonathan Hutchinson called it, without knowing of the description previously given by Duhring, or *prurigo hiemalis*, as the latter has called it, may be given as follows: He first noticed an unusual dryness of the skin, the hair and nails also partook of this condition, and became dry, brittle, and lustreless; the parts exposed, such as the hands and face, were rough and sometimes chapped. The skin over the body, as winter approached, became tender to the touch, and the friction of the clothing almost amounted to pain. But little was thought of this until the itching began, which is

the main subjective symptom, and for which he applies for relief. It came on at night, sometimes during the evening, but not until the clothing was removed at bedtime did it become unbearable.

You see certain parts of the body are covered with small, lentil-sized, dark crusts, the results of scratching; again, furrows of denuded epidermis show where the nails have been more vigorously applied. (Fig. 1.) A peculiarity of the itching is that it comes on in paroxysms, the first lasting, as he says, about an hour. This subsides, to return again towards morning. In donning the clothing for the day his cutaneous surface smarts and feels sore.

In regard to its etiology, we know that it is caused by atmospheric influences which operate only in a low temperature, and that protecting the body from cold by means of warm clothing or by remaining within doors does not of itself act as a prophylactic measure. We further know that it attacks young adults more frequently than the aged or the very young, that males and females are equally afflicted, and that the colored race does not enjoy an immunity from the disease. We believe that a special bodily condition exists which renders the subject predisposed to the disease, and that it is due to some defective innervation of the skin; further than this we cannot say.

The treatment we will recommend is as follows: a five-grain capsule of ichthyol is to be taken after meals; he is to wear underneath his flannel underclothing fine cotton or gauze; he should exercise self-control when the first itchy sensation occurs; failing in this, an ointment of twenty grains of resorcin, two drachms of glycerin, and six drachms of lanolin is to be applied to the itchy parts. He is to bathe not oftener than once a week.

This is not to be recommended in all cases. In some the chloride of gold and sodium, one-twentieth of a grain, is to be preferred to ichthyol, especially in those whose nervous system is deranged, as manifested by sleeplessness and despondency, alternating with fretful and irritable moods.

Of much more importance, however, is the external management of the disease. In every case we can mitigate the suffering and sometimes cause the disease to disappear by these measures alone.

First, as a prophylactic measure, an effort should be made to maintain the skin in its natural condition. When the oily secretion is diminished, as evidenced by roughness, an artificial unguent should be applied, such as vaseline, lanolin, lard, or a combination which I have found to be useful, consisting of one drachm of glycerin, four drachms of lanolin, and vaseline a sufficient quantity to make an ounce. This



FIG. 1.—A typical case of *prurigo hiemalis* or winter itch.

should be kneaded into the skin once or twice daily. The patient should abstain from bathing with soap and water as much as possible ; the exposed surfaces of the body—namely, the flexor surfaces of the limbs—should be protected from irritation by wearing soft under-clothing, as cotton, silk, gauze, etc.

To control the paroxysms of itching I know of nothing better than resorcin. It may be used in a five-per-cent. solution, or, what is better, incorporated with the ointment as given above. The skin will in time become accustomed to this drug, when carbolic acid should be added in a strength varying from ten to twenty drops to the ounce. Finally, the patient can accomplish much by mental control : he should be instructed to withstand as much as possible the desire to scratch. In several cases this, accompanied by a simple soothing application, has proved all-sufficient.

The prognosis varies. Sometimes the disease continues for many years in spite of all we can do. It may also give rise to other diseases, such as eczema ; it also offers an opportunity for the inoculation of poisonous substances concealed under the finger-nails. In most cases, however, the disease after many years shows a tendency to disappear, while in all cases we have one panacea, a change of climate.

Closely allied to the preceding is this case, which we will next examine. He gives the following history : four years ago he first noticed an eruption on the back of the right hand ; it consisted of a roundish patch about the size of a quarter of a dollar. His attention was first directed to it on account of the itching. Soon the lesion became more apparent, was circumscribed, and covered with a few loosely-adherent scales. Within a fortnight similar spots appeared on the same hand, and, later in its course, one or two small ones were noticed on the opposite hand, in a position corresponding to the one first involved. The patient tried several applications before consulting a physician, but the disease did not yield until the following spring.

The patient at the time was a resident of this city ; the next winter, however, his occupation called him to Florida, during which time he was free from the eruption. The third winter after the first attack the patient again removed to the lake region of Northern Ohio, when he noticed at the approach of cold weather that the exposed parts, especially the hands, became very rough, but no distinct eruption appeared until the 2d of January, at which time the patient says the weather was very severe, and his occupation kept him out of doors.

The lesions appeared in the same positions and occupied the same sites as were occupied two years before ; the only difference noticed

was that the lesions were larger. Again he applied for medical aid, but not until the following May did the eruption disappear. During the summer following his hands remained entirely free, but at the approach of cold weather one year ago the patient was warned by the dry and irritable condition of his hands that the eruption was about to return, which it did during the month of December. The disease again disappeared the following spring, and this winter has returned more severely than ever.

There, on the back of the right hand, you see three lesions, varying in size from a dime to a half-dollar, roundish in shape, of a dull red color, and covered with a light coating of scales. The itching, when it first appeared this winter, was very severe, and was especially noticeable between four and eight o'clock in the evening, at which time he could not refrain from scratching, after which it gave him little annoyance until the following evening. On the opposite hand there are four lesions, smaller in size than those just described, but presenting the same general features. It is evident that we have here an inflammation of the skin, circumscribed, markedly thickened, accompanied by paroxysmal irritation, and presenting the usual characters of a chronically inflamed skin,—namely, the determination of blood to the part, which may be removed by pressure, a slight exudation of serum which may be demonstrated as you see by scratching off the scaly covering. Again, like other chronic inflammations of the skin, it is more prone to a moderate formation of scales than to a watery exudation.

The patient says the disease has never invaded other parts of the body, and until this eruption came, four years ago, there had never been any skin-disease in his own history or that of his family. As you see, he is a man well developed, of medium height, and says he has always enjoyed perfect health. The question naturally arises as to what influence or bodily condition we must ascribe the disease before us. Concerning the latter we can see no evidence of general disturbance; his own statement bears this out. We do find, however, external influences playing a most important rôle. The summer's heat, the sun's rays, which irritate some skins, have no effect on the case before us. On the contrary, cold, or the atmospheric condition accompanying it, is, without question, the exciting cause.

It will be remembered that the disease occurred for the first time while the patient was residing in Northern Ohio; it remained during the cold weather, and disappeared at the approach of spring. The following winter he was in a mild climate, during which time the erup-

tion did not reappear. His returning to the North the following winter brought out a fresh attack, and so on to the present time.

This disease is one that I have called *dermatitis hiemalis*,¹ believing the name to be expressive of the condition and simplifying the nomenclature, as we already have the *prurigo hiemalis* of Duhring.

In making a differential diagnosis we must first consider in what the eruption differs from eczema: first, eczema appears at all seasons of the year, while the disease under consideration is met with during the winter alone. Eczema occupies different parts of the body, while the disease before you is confined to the back of the hands, sometimes extending to the wrists, and very rarely occupying corresponding positions on the feet. Eczema, as a rule, is inclined to extend at the periphery, its margin gradually merges into the healthy skin, while *dermatitis hiemalis* is well defined, its margins standing out in bold relief similar to the lesions of *psoriasis*. The itching in eczema is usually less paroxysmal, while the itching in the disease before you is less severe, excepting at the outset, and occurs at the close of day. The color, too, is darker than are the lesions of eczema, and usually presents a distinct purplish tint. Exudation is not a conspicuous feature as is the case with eczema. Eczema does not tend to recur year after year in the same position, while the disease before you is noticeably of yearly occurrence. With these characteristics I believe we are justified in regarding it as distinct from eczema and closely allied to *prurigo hiemalis*, or at least an hybrid condition between the two afflictions.

The treatment in this case will consist of local measures alone: a diachylon plaster containing seven per cent. of salicylic acid, spread on strips of linen sufficiently large to cover the lesions, is to be bound upon the parts and changed twice daily. As far as practicable, he will be directed to protect the hands from cold by wearing fur gloves.

¹ "Cold as an Etiological Factor in Diseases of the Skin, with a Report of Cases," read at the International Medical Congress, Rome, 1894. Published in the Journal of Cutaneous and Genito-Urinary Diseases, November, 1894.

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